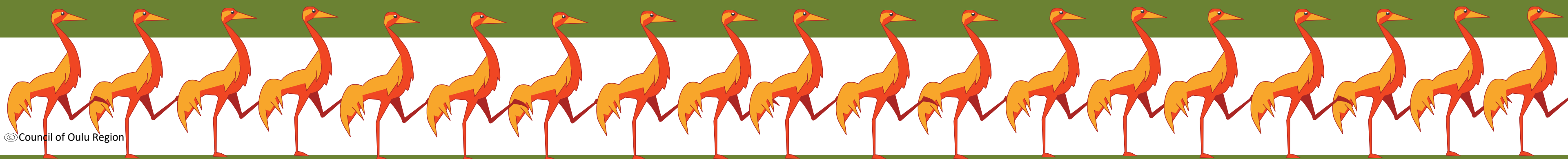


# Northern Ostrobothnia Climate Roadmap

## 2021–2030 2.0

### Towards a carbon neutral Northern Ostrobothnia

### Everything matters





Cross-generational  
responsibility

We do not own land –  
we borrow it from future  
generations

# Table of contents

- Introduction
- Climate Roadmap 2.0 update background
- Current situation: Starting points of Northern Ostrobothnia’s climate action
- Greenhouse gas emissions
  - Background
  - Effort sharing sector
  - National Greenhouse Gas Inventory
- Key themes of Northern Ostrobothnia’s climate action – Everything matters
  - Smart bioeconomy and circular economy underpin climate action
  - Sustainable, efficient and low-emission energy production and use
  - Low-emission transport
  - Agriculture becomes a better carbon sequester
  - Land use is climate-smart and conducive to the circular economy
  - Forests and bogs act as efficient carbon sinks
  - Cooperation and cross-sectoral operating models create vitality and business opportunities
  - Adaptation
  - Summary of key themes
- Possibility for large emission reductions
- Vision
- Implementation and monitoring
- Appendices
- Links and roadmap authors



## Appendices

Appendix 1: Northern Ostrobothnia Climate Roadmap (NOCR) process and updating work 2023–2024; Appendix 2. Workshops and seminar of the NOCR work; Appendix 3: Guidance and interaction of the NOCR work; Appendix 4. Groups steering Northern Ostrobothnia’s climate action Appendix 5: POPilmasto project steering group and more detailed scenarios; Appendix 6. Message from young people

# Introduction



Euroopan unioni  
Euroopan aluekehitysrahasto



Elinkeino-, liikenne- ja  
ympäristökeskus



Vipuvoimaa  
EU:lta  
2014–2020



POPilmasto



LIFE17 IPC/FI/000002  
LIFE-IP CANEMURE-FINLAND  
CANEMURE-hanke on saanut rahoitusta  
Euroopan Unionin Life-ohjelmasta.



OAMK  
OULUN AMMATTIKORKEAKOULU

In January 2019, the Board of the Regional Council decided that the climate and energy strategies from 2010 and 2012, respectively, would be updated into a joint climate roadmap defining the climate objectives and measures. The region's climate objectives are based on researched data and extensive cooperation with actors. The Council of Oulu Region coordinates the roadmap process with its POPilmasto ("Northern Ostrobothnia Climate Roadmap") project. The POPilmasto project has received ERDF funding from the Centre for Economic Development, Transport and the Environment (ELY Centre). The work has been carried out in close cooperation with the Canemure project (Towards Carbon Neutral Municipalities and Regions), for which the Oulu University of Applied Sciences has regional responsibility.

An advisory board was set up to guide the region's climate action. The advisory board includes trustees appointed by the Board of the Regional Council and representatives of a wide range of stakeholders, taking into account companies, RDI and the public sector as well as civil society organisations. In cooperation with the Canemure Regional Cooperation Group, the advisory board has provided their guidance on the definition of climate objectives and the consideration of the specific features of the region. The willingness and commitment of the operators is reflected in the end result of the roadmap.

The inaugural meeting of the steering groups of climate action in Northern Ostrobothnia on 16 May 2019, the following was agreed:

- ✓ Climate action is expected to have a positive spirit of solidarity and cooperation, not confrontation: There should be common, ambitious yet realistic and achievable targets for all sectors, not just the public sector. New ways of doing things, courage, vision and concrete measures.
- ✓ The climate objectives should include a broad range of themes from different sectors: Transport, land use, housing, community planning, construction, circular and bioeconomy, energy, local food, boglands, forests, natural resources, innovation and new technologies, biodiversity as well as consumption habits and the activation of residents.
- ✓ The setting of objectives must focus on the necessary measures that can be influenced at the regional level.

The workshops and seminars were attended by a large number of actors in the region. The roadmap, which is the result of the latest information and interaction, contains a description of the current situation, key themes with measures, more detailed information on those sectors which are important to the region (transport, agriculture and energy use of peat) as well as a model for the promotion and monitoring of measures. The established cooperation network will continue its activities in support of the diverse climate action in the region.

The roadmap provides guidelines for the development of the operating environment so that the sector's developer organisations can allocate their resources correctly. Companies make their own strategic decisions on the development and renewal of their business operations, taking into account the opportunities provided by the operating environment and the high level of RDI support available. Companies are key players and guided by consumers. The achievement of climate objectives requires a strong link between economic life, new industries and business opportunities as well as climate action. By developing the operating environment as well as taking into account the environmental, economic, social and cultural impacts, climate change mitigation is both possible and an opportunity.

The journey made in the roadmap process has been as important as the outcome. The starting point for the work has been "finding solutions, not just someone to blame". The scope of the seven key themes and measures selected for the roadmap is intended to show that climate change affects all sectors and all of us. Our vision for a "carbon neutral Northern Ostrobothnia" will be achieved not only through the right decisions and concrete actions but, above all, through cooperation. Northern Ostrobothnia is contributing to reaching Finland's 2035 carbon neutrality target.

The Northern Ostrobothnia Climate Roadmap (NOCR) was approved by the Board of the Regional Council in February 2021.

As part of the implementation and monitoring of the climate roadmap, it was decided to update the work in 2024.

**Many thanks to all those who participated in the work.**

# Climate Roadmap 2.0 update background

Northern Ostrobothnia’s Climate Roadmap 1.0 was approved in February 2021 at a time when significant resources were being allocated to climate work in the form of the EU Green Deal, the European Structural Funds Programme as well as national funding, for example. The climate roadmap has been linked to practical climate action under Innovation and Skills in Finland 2021–2027 in the funding of the EU’s regional and structural policy programming period under Priority 2, Carbon neutral Finland. The knowledge and experience gained from the roadmap work were also utilised in the preparation of the region’s transition plan under the Just Transition Fund. Implementation of the programmes is under way.

Since 2021, the state of Europe has changed significantly. The importance of northern Finland has been emphasised especially in terms of accessibility and renewable and sustainable energy production as well as the opportunities offered along its entire value chain. The programme for northern Finland, a joint initiative of northern operators, focuses, among other things, on strengthening northern growth and on the issues related to Nordic cooperation. The programme for northern Finland was approved as a government-led programme, which has been included in the Programme of Petteri Orpo’s Government.

This update does not change the original guidelines and measures of the climate roadmap. In order to maintain the message of climate roadmap 1.0 and its large amount of information, the updated version 2.0 has the structure and content of the original roadmap. The changes concern data updates, such as greenhouse gas emissions; the latest figures have been presented. The roadmap has been updated with new information on key themes, such as energy and land use. The cultural theme has been highlighted in connection with the key theme 7. The views of young people, organisations as well as the Education and Research Cooperation Group have been heard. Four Municipal Climate Plan workshops were organised for the municipalities as well as several Climate Coffee events which were open to all.

***The authorisation of the work and the timeliness of the measures are based on the latest information and extensive dialogue with the operators. The measures take into account the special characteristics of the region and, in addition to the climate goals, they strengthen the environmental values and vitality of the region. Consideration of social justice is essential in the implementation of measures.***

The updated version 2.0 forms a whole which continues to uphold the original climate roadmap and its message. The NOCR 2.0 was approved by the Board of the Regional Council in June 2024 and replaces the climate roadmap approved in February 2021.

The goal of Northern Ostrobothnia’s climate action remains unchanged:

## **Towards a carbon neutral Northern Ostrobothnia!**

The advisory board steering Northern Ostrobothnia’s climate action was established and appointed for its second term in 2022–2025 (Appendix 4; 4/4). The advisory board, chaired by Jussi Ylitalo, met six times during the updating work.

The core messages of the climate roadmap can be found on the story map in [Finnish](#) and [English](#).



**Many thanks to all of those who participated in the work.**

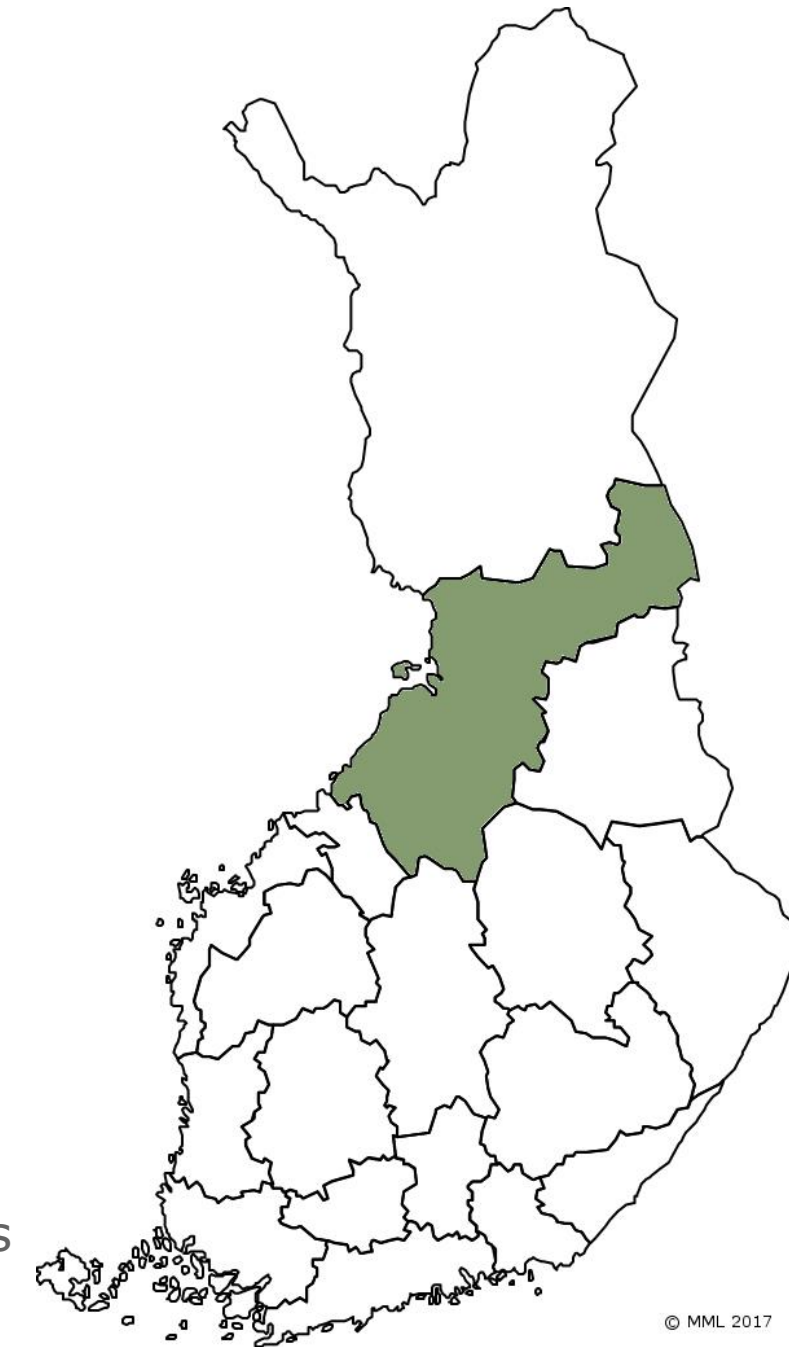
# Starting points of Northern Ostrobothnia's climate action

- Forest stand grows 10.2 Mm<sup>3</sup> and felling removes approximately 8.4 Mm<sup>3</sup> of trunk trees per year (National Forest Inventory 13/12 LUKE Statistics Database)
- The region has the most bogs in Finland: about 50% of the land used for forestry is peatland.
- One of the country's largest producers of milk and beef
- The largest organic farming area of all regions  
Most organic arable land: over 39,000 ha
- The wind power region of Finland: approximately 40% of wind power capacity is in Northern Ostrobothnia.
- Long distances
- Enterprises – RDI – Competences

- 11 Hinku municipalities\*: ~ 21% of the residents  
Haapajärvi, Ii, Lumijoki, Muhos, Oulainen, Pyhäjärvi, Raahe, Tyrnävä, Utajärvi, Vaala and Ylivieska

\*Coordinated by the Finnish Environment Institute  
The network of carbon neutral municipalities (Hinku) aims to reduce emissions by 80% between 2007 and 2030.

- The City of Oulu's environmental programme covers ~ 50% of the residents
- Municipal energy efficiency agreements (KETS) and resource-saving activities:  
In Northern Ostrobothnia, 17 municipalities have signed KETS agreements



© MML 2017

**~ 418,200 inhabitants, 30 municipalities**

# Northern Ostrobothnia greenhouse gas emissions: Background

The roadmap examines greenhouse gas emissions in Northern Ostrobothnia mainly in accordance with the Hinku limits of the regional calculation model (ALAs) produced by the Finnish Environment Institute. The calculation mainly concerns emissions from the effort-sharing sector and the factors that can be influenced in municipalities. Carbon neutral municipalities (Hinku) aim to reduce emissions by 80% from 2007 to 2030.

The Hinku-limited figures, which are shown in the ALAs calculation model, do not include

- emissions trading for industry,
- land use, land use change and forestry (LULUCF) (In this case, the carbon sequestration effects of the sector are not visible and the carbon balance of the sector cannot be determined. It is important to take this into account when looking at the emissions figures for agriculture and forestry),
- total emissions from construction (Carbon footprint calculation of construction materials throughout the building's lifespan will be developed, e.g. Ministry of the Environment of Finland), low-carbon construction and www.carbonneutralfinland.fi), or
- international shipping or icebreakers.

The methods of the calculation models are constantly being developed. The emission figures for Finnish municipalities are updated annually.

Greenhouse gas emissions are calculated as carbon dioxide equivalents (CO<sub>2</sub>e), thereby quantifying the global warming effect of the greenhouse gases. The contribution of other greenhouse gases is converted to reflect the contribution of carbon dioxide.

Coefficients:

CO<sub>2</sub> (carbon dioxide): 1

CH<sub>4</sub> (methane): 28

N<sub>2</sub>O (dinitrogen oxide): 265

NF<sub>3</sub> (nitrogen trifluoride): 16,100

SF<sub>6</sub> (sulphur hexafluoride): 23,500

Greenhouse gas emissions are monitored according to the **effort-sharing sector and the emissions trading sector**. In the EU, emission trading regulates emission allowances. The emission allowance system covers large industrial installations, large electricity and heat production installations as well as intra-EU air transport.

The effort-sharing sector includes transport, part of agricultural greenhouse gas emissions, emissions from separate heating of buildings, machinery, waste management and fluorinated greenhouse gases.

According to EU legislation, Finland must reduce its greenhouse gas emissions from the effort sharing sector by 50% (39% in 2021) by 2030 compared to the levels in 2005. The EU is committed to reducing its CO<sub>2</sub> emissions by 55% by 2030 from the levels in 1990. The goal is to achieve climate neutrality in the EU by 2050.

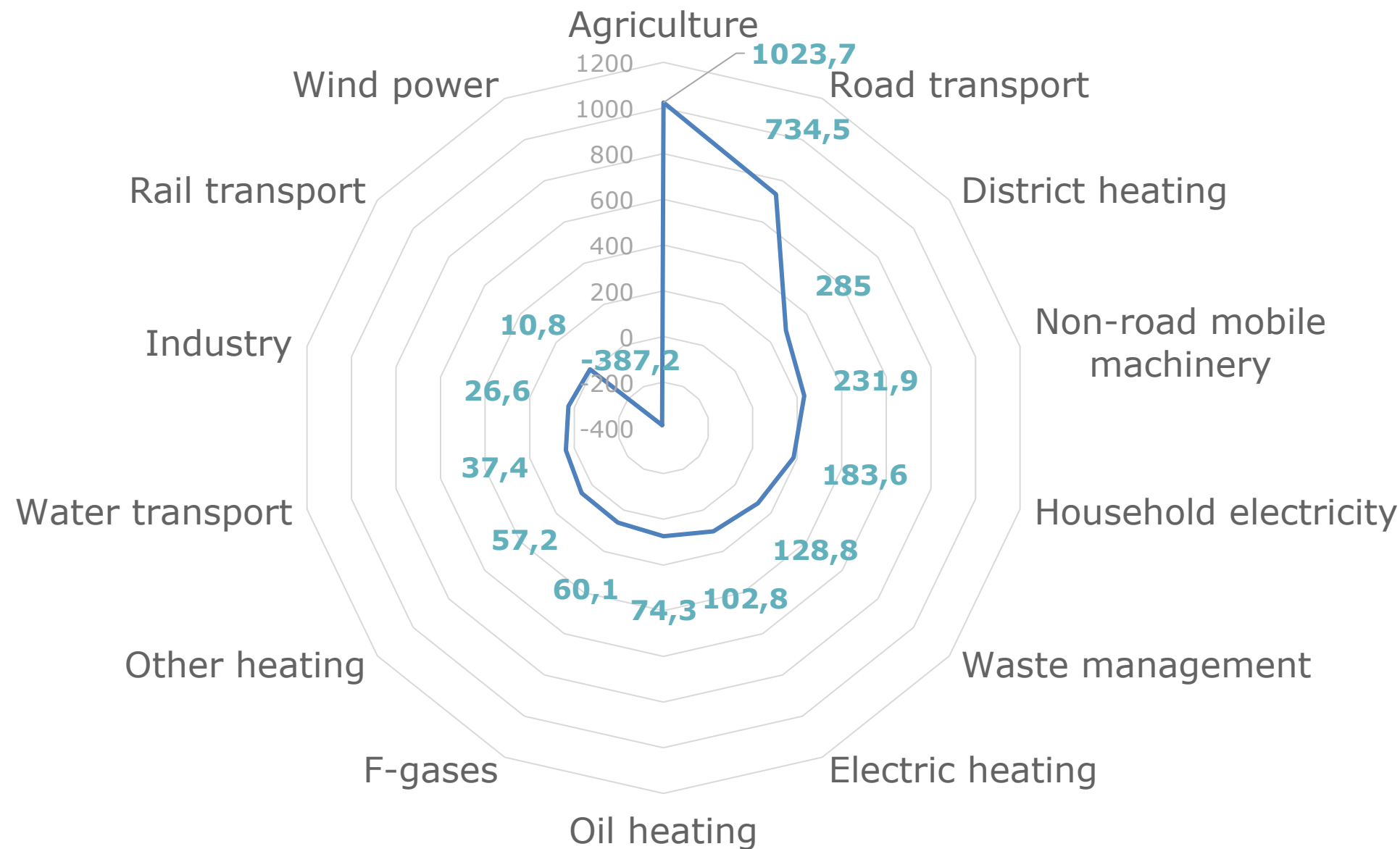
Statistics Finland reports the emission figures including the effort-sharing sector and the emission trading sector and an estimate of the LULUCF figures in accordance with National Greenhouse Gas Emission Inventory. Statistics Finland produces emission data for the energy sector and industrial processes in the inventory. VTT Technical Research Centre of Finland produces emissions data for the energy sector for transport and machinery. The Finnish Environment Institute calculates the emissions data for the waste sector and fluorinated gases. The calculation for land use, land use change and forestry (LULUCF) is the responsibility of Natural Resources Institute Finland.

From the beginning of 2021, the LULUCF sector has been included in the national reporting. According to the EU LULUCF Regulation of 2018, the land use sector, which includes sinks and emissions from land use, land use change and forestry, must not generate uncompensated emissions in the periods 2021–2025 and 2026–2030.

# Northern Ostrobothnia greenhouse gas emissions and their evolution: Effort sharing sector

Year 2022

Regional calculation (ALAs) with Hinku limits  
(kt CO<sub>2</sub>e)



Year	kt CO <sub>2</sub> e	Change
2007	4 295	
2018	3389 (3559*) Wind power compensation - 256 kt CO <sub>2</sub> e, taking into account: 3 133 (3 303*)	Change 2007–2018 -26%
2018: 7.6 (8.0*) t CO <sub>2</sub> e per capita		
2022	3 194 Wind power compensation - 387 kt CO <sub>2</sub> e, taking into account: 2 807 kt CO <sub>2</sub> e	Change 2007–2022 -35% 2018–2022 -11%
2022: 6.7 t CO <sub>2</sub> e per capita		
<b>Percentage of total emissions in 2022:</b> Agriculture 31% Road transport 23% District heating 8%		

\*The calculation methods have been updated since 2021. For comparison, the values that were in the climate roadmap 1.0 publication have been left in parentheses.

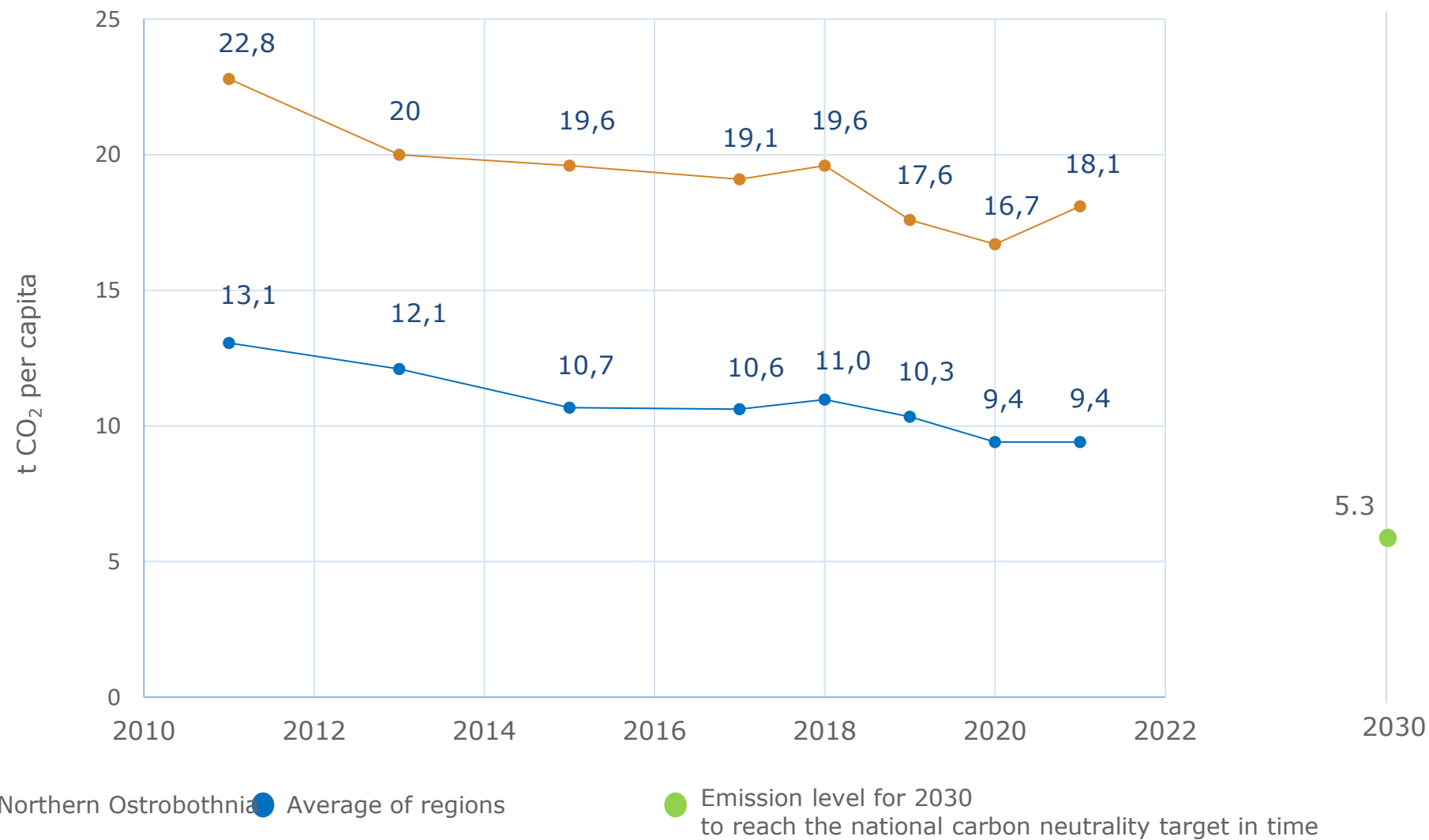
\*The population was 413,000 in 2018 and 416,543 in 2022.



# Northern Ostrobothnia greenhouse gas emissions and their evolution: Effort-sharing and emissions trading sectors

Year 2022

## National Greenhouse Gas Inventory:



### National Greenhouse Gas Inventory (Statistics Finland)

When the NOCR was published in 2021, the most recent emissions data was from 2018. At that time, the calculated greenhouse gas emissions of Northern Ostrobothnia, including the industries covered by the emissions trading scheme, were 8,051 kt CO<sub>2</sub>e.

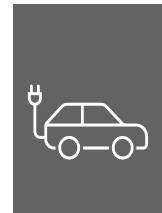
**The figure per capita is the highest in Finland: 19.6 t CO<sub>2</sub>e.**

Nearly half of this was due to the carbon dioxide emissions of SSAB’s Raahе steelworks. The plant accounts for 7% of Finland’s emissions.

SSAB in cooperation with LKAB and Vattenfall are developing fossil-free steel production. The HYBRIT project for iron-ore based steelmaking is intended to replace coke with fossil-free electricity and hydrogen. The change will revolutionise steel production and contribute to the objectives of the international and national climate targets.

In the update of the climate roadmap, according to the latest emissions data for 2021, the greenhouse gas emissions of Northern Ostrobothnia, including the industries covered by the emissions trading scheme, were 7,540 kt CO<sub>2</sub>e.

**The figure per capita remains the highest in Finland: 18.1 t CO<sub>2</sub>e.**



# Key themes of Northern Ostrobothnia's climate action

1. Smart bioeconomy and the circular economy underpin climate action
2. Sustainable, efficient and low-emission energy production and use
3. Low-emission transport
4. Agriculture becomes a better carbon sequester
5. Land use is climate-smart and conducive to the circular economy
6. Forests and bogs act as efficient carbon sinks
7. Cooperation and cross-sectoral operating models create vitality and business opportunities

Adaptation as part of key themes

# 1. Smart bioeconomy and the circular economy underpin climate action

Our region is involved in climate change mitigation, the region’s abundant natural resources are exploited sustainably and ecosystems are safeguarded. Northern Ostrobothnia is a region which has a bioeconomy and circular economy, where the operating environment supports the goals.

The bioeconomy and circular economy are rapidly developing sectors and their operating environment is changing dramatically. Political instruments, legislation and targets for a low-carbon economy, but above all market-driven demand, which underpins profitable business, all advocate production that is based on renewable bio-based raw materials.

Major bioeconomy projects and changes in the raw material base of biorefining are under way in the region and its surrounding areas. In industrial-scale processes, side streams can provide new, profitable business for SMEs.

Increased research data and new innovations open up new processing opportunities for high added-value products, for example, and provide conditions for new low-carbon business. In regional economics, the potential for further processing is higher than the production of raw materials.

Companies, in cooperation with RDI and public sector, are actively developing the bioeconomy and circular economy. In addition to technology know-how, business skills and market knowledge are needed to succeed in competition. In order to put the research into practice, the financing of demo and pilot projects is essential. New investments are needed in the region and for accessing international markets.

The strengths of Northern Ostrobothnia include abundant biomass reserves and related primary production, clean soil and water, the advantages of arctic production and good transport connections. The region’s companies, experts and RDI organisations’ investments in the industry and cooperation create opportunities for the success of bioeconomically diversified Northern Ostrobothnia, including as a provider of global solutions.

The bioeconomy is a significant part of Northern Ostrobothnia’s business. The production and processing of renewable natural resources accounts for approximately 21% of the private sector turnover: primary production, processing of bioproducts, energy products and waste treatment. When we include tourism, recreational use of nature and ecosystem services with their intangible benefits, the significance increases further.

In Northern Ostrobothnia, the bioeconomy benefits the region in a variety of ways in the growth centres and rural areas. The most important sectors in the region are agriculture and forestry, chemical wood manufacturing industry, mechanical forest industry and the food industry.

The [Northern Ostrobothnia Bioeconomy Development Strategy](#) is from 2015. The implementation of the strategy and its [update](#) were implemented in the [Towards a Sustainable Economy – Implementation of the Oulu Region Bioeconomy Strategy](#) (PPBIO) project in 2018. The climate roadmap’s bioeconomy measures are in line with the region’s bioeconomy strategy.

The [Northern Ostrobothnia Rural Development Plan 2023–2027](#) outlines one of the priorities for an environmentally wise and climate-smart agricultural and rural region.

Finland’s national bioeconomy strategy is originally from 2014. It was updated in 2021 and published in 2022. [Finland’s Bioeconomy Strategy 2022](#) takes into account circular economy solutions and operating practices as well as the usability of renewable natural resources in more detail than the previous strategy. The aim is to refine high value-added products and services based on strong expertise in Finland as well as to strengthen cross-sectoral cooperation. Vision: “Sustainably towards higher value added.”

Net sales of the bioeconomy industries in Northern Ostrobothnia (EUR 1,000) in 2022

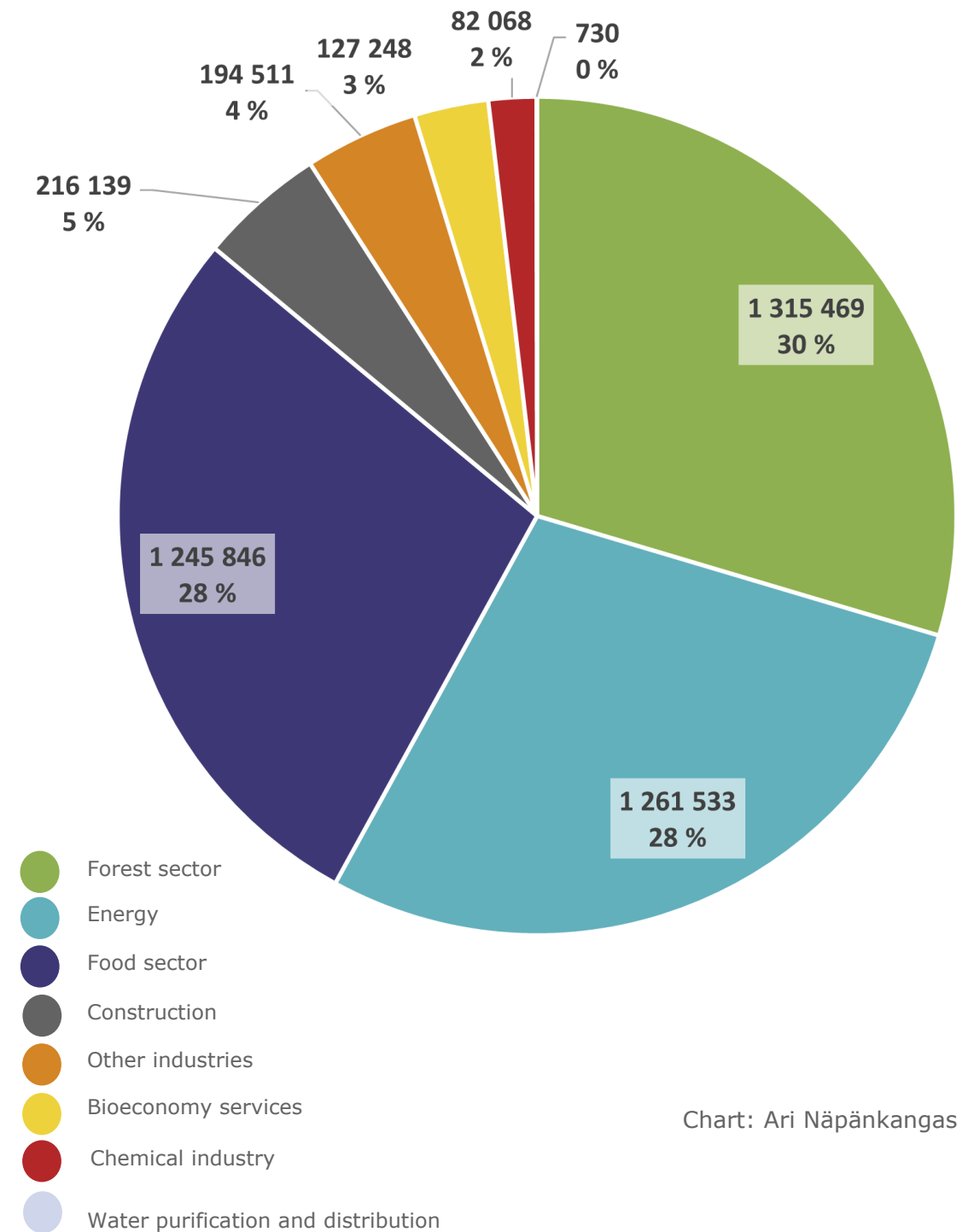


Chart: Ari Näpänkangas

Statistics Finland, municipal statistics on local kind-of-activity units; Suomen Asiakastieto Oy, Business Information System YTI



# 1. Smart bioeconomy and the circular economy underpin climate action

## 1. Production and the use of biogas are promoted while taking into account the nutrient cycle and environmental impacts

- Promotion of biogasification of biowaste and sludge
- Liquefaction of biogas on farms
- Biogas plant sludge recycling in the field and monitoring of harmful substances
- Promotion of biogas carbon capture solutions at biogas plants

Y, L, O, OV, KK, E, G, C, ELY, PPL

## 3. Wood construction promoted as part of climate-friendly construction

- Pilots
- Utilising multidisciplinary RDI activities
- Hybrid and renovation construction
- Modularity

Y, OY, O, C, MK, RV, KE, PPL

## 5. Utilisation of ICT expertise

- New business models for the circular economy: building ecosystems, platform economy, servitisation
- Making use of big data

Y, O, OY, ELY, KE, PPL

## 7. Carbon capture and storage

- Technical carbon sinks
- Carbon storage
- Power-to-X
- Biocarbon

Y, OY, O, C, MK

## 2. Natural resources – development of sustainable products and business

- Renewal of the value chain of wood production and processing as well as the comprehensive utilisation of wood
- Combustion of fractions from which the valuables have been removed
- Utilisation of side streams from the pulp industry
- Development of carbon-binding products
- Berries and mushrooms: support for SMEs, processing of products of higher value added
- Exploiting food processing side streams more effectively
- Tourism and ecosystem services

Y, L, O, OY, C, MK, ELY, KE, S, PPL

## 4. Coordinated use of soil, rock and recycled materials in accordance with the circular economy

- Use of MARA and MASA (Government Decree on the Recovery of Certain Wastes in Earth Construction)
- Contaminated soil, *in situ* rehabilitation
- Recycling of building demolition materials
- Coordination through a system/data platform

Y, O, OY, KK, RV, ELY, PPL

## 6. Waste and side streams recycled and recovered

- Promoting the ash fertilisation of forests
- Side streams of industrial operations as a raw material for new products
- Creating new industrial and other symbiosis

Y, L, O, OY, KK, E, MK, C, ELY, KE, S, PPL

Parties responsible: Y: Companies, such as OV: Oulun Vesi waterworks, KK: Kiertokaari, E: Energy companies, G: Gasum; RDI organisations (L: LUKE, O: Oulu UAS, OY: University of Oulu, C: Centria, S: Syke, MK: Finnish Forest Centre), public sector (RV: Building supervision authority, ELY: ELY Centre, KE: Municipal enterprises, PPL: Council of Oulu Region)



## 2. Energy production and use are sustainable, efficient and low-emission

*Northern Ostrobothnia is a region of renewable and low-emission energy. The region develops and increases the production of fossil-free energy, intelligent energy systems and energy efficiency. Northern Ostrobothnia is strongly involved in the development of future energy sources and in solving the challenges caused by the transformation of the energy economy.*

- Northern Ostrobothnia is the leading wind power producer in Finland. Forty per cent of the country's wind power (4,583 GWh per year, ET statistics 2022) is produced here. Wind power production is estimated to double from its current level by 2030. Due to the rapid growth of wind power, the region has set up the TUULI project, the aim of which is to promote the sustainable development of the sector. Offshore wind offers plenty of additional potential for energy production. The phased regional plan for energy and climate in Northern Ostrobothnia, which is under preparation, identifies regionally significant (> 7 km<sup>2</sup>) areas which are suitable for wind power production. Work Package 2 of the EMMI project focusing on the energy transition and assessment of the climate impact of land use in Northern Ostrobothnia, examined the climate impacts of wind power projects in the phased regional plan as well as solar power production in general. Other impacts of wind power projects due to land use changes, such as impacts on biodiversity, were not assessed.<sup>(1)</sup> It should be noted that the objectives of renewable energy and land use are partly in conflict with each other.

- Introduction of renewable energy into the electricity network is possible by increasing the adjustment capacity and storing energy. Hydrogen provides a store of renewable energy with seasonal variation and further processing opportunities. The hydrogen pipeline that wraps around the Bothnian Bay along the coast of Northern Ostrobothnia is part of the European hydrogen vision. According to the report of the EMMI project's Work Package 1, the municipalities of Northern Ostrobothnia are also interested in utilising the hydrogen economy in inland locations.<sup>(2)</sup>

- The importance of peat in energy production is decreasing. The socially just transition of peat production and security of energy supply are key issues to be resolved. In energy production based on combustion, peat is mainly replaced by wood and waste materials. The estimated reduction in greenhouse gas emissions by 2035 is 700 kt CO<sub>2</sub>e.<sup>(3)</sup>

- Biogas production offers the strong agricultural region new opportunities for both the regional economy and the reduction of greenhouse gas emissions.<sup>(4)</sup> New biogas production plants are being planned for different parts of the region.<sup>(5)</sup>

1) Assessment of the climate impact of land use in the phased regional plan for energy and climate in Northern Ostrobothnia

2) Opportunities for renewable energy production and the related green hydrogen economy and land use framework conditions in Northern Ostrobothnia

3) Development of peat energy use and effects on the wood supply chain and greenhouse gas emissions in Northern Ostrobothnia

4) Scenario review on the sustainable utilisation of agricultural biofractions and side streams as well as that impact of measures in Northern Ostrobothnia

5) [https://oamk.fi/wp-content/uploads/2023/12/BioKaMa\\_Loppuraportti.pdf](https://oamk.fi/wp-content/uploads/2023/12/BioKaMa_Loppuraportti.pdf)

YVA: Environmental impact assessment; ET: Finnish Energy



## 2. Energy production and use is sustainable, efficient and low-emission

### 1. Renewable energy production replacing fossil energy will be promoted based on the region's strengths

- Wind power (onshore and offshore)
- Geothermal energy
- Solar energy
- Biogas
- Production of renewable transport fuels
- New forms of fossil-free energy production
- Power-to-X
- Heat pumps
- Bioenergy
- Pump plants
- Hydrogen economy
- Nuclear microreactors

### 2. Developing a low-emission, efficient and flexible energy system

- Decentralised production of renewable energy
- Solutions relating to energy storage
- Utilising waste energies
- Flexibility of electricity consumption and related ICT solutions
- Electrification of energy use
- Smart inter-sectoral cooperation
- Energy measurement made visible

### 3. Supporting energy efficiency and low emissions

- The use of oil from fossil sources for heating will be discontinued
- Promoting energy efficiency in buildings and housing (information, advice, smart solutions, financing, social equality\*)
- Arctic energy efficient construction ecosystems
- Reducing the energy use of peat as planned, taking into account energy security and socially just transition



#### KETS – Municipal energy efficiency agreements

- A means to achieve the energy efficiency targets of the EU Energy Efficiency Directive (EED)
- In Northern Ostrobothnia, 17 municipalities are involved in the current agreement period of 2017–2025
- Objective: A new contract period of 2026–2035 begins on 1 January 2026.

#### EED, Preparation and implementation of the Energy Efficiency Directive update ongoing

- Entry into force 10 October 2023, national preparation by October 2025
- The implementation of the obligations will require municipalities to collect more accurate data and monitor buildings, building repairs and energy consumption. In addition, the role of municipalities' voluntary energy efficiency agreements will be further strengthened
- Learn more: Energy Authority

Parties responsible: Municipalities, Regional Council, energy companies, wind farm owners, companies, RDI organisations, educational institutes, consumers

\* Regional energy advisory project in Northern Ostrobothnia funded by the Energy Authority: Feasib Consulting



### 3. Low-emission transport

**Greenhouse gas emissions from transport in Northern Ostrobothnia in 2022 were 734.5 kt CO<sub>2</sub>e. Road transport accounted for 23% of the region’s emissions.**

Finland is committed to reducing CO<sub>2</sub>emissions from transport by 50% by 2030 from the levels in 2005.

According to the national forecast, CO<sub>2</sub> emissions from transport will decrease by 37% over the period considered. This decrease is mainly due to the impact of the biofuel distribution obligation and EU legislation on car manufacturers. In terms of the missing reduction of 1.65 Mt CO<sub>2</sub>, the national toolbox includes not only measures to accelerate the change in propulsion power, but also the measures to improve the efficiency of the transport system and reduce fossil fuels.

The regional implementation of national emission reduction commitments for transport will focus on creating the conditions for a shift to low-emission means of transport and the implementation of the cross-cutting climate objective in knowledge-based transport system planning.

Reducing emissions from transport at the national level is central to the National Transport System Plan (Transport 12). The roadmap for fossil-free transport examines ways to halve greenhouse gas emissions from transport by 2030 compared to the levels in 2005.

Four northern regions have developed a common transport strategy for the north. The strategy brings together the counties’ common will, vision and measures for the development of the transport system. The review period of the strategy is until 2036. In the northern transport strategy, the common vision, objectives and measures are guided by cross-cutting themes, which include reducing transport emissions, estimating biodiversity loss and adapting to climate change.

The Northern Ostrobothnia Transport System Plan 2040 was being updated in spring 2024. The update of the Oulu Region Transport System Plan 2040 was also in process. Climate targets will continue to be relevant in both plans.

In reducing emissions from transport, the emphasis is on cooperation between different sectors and the coordination of different measures. The region aims for more sustainable mobility. Reducing CO<sub>2</sub>emissions also creates opportunities, mainly through the development of regional biofuel production.

A study carried out in the POPilmasto project concluded that the role of traffic propulsion systems is the most significant in reducing traffic emissions. The study’s climate-positive forecast shows less transport growth, rapid electrification of car transport and a shift to low-emission vehicles in heavy transport after the mid-2020s. The table presents the actual propulsion development of cars. The number of cars has grown, but the share of alternative propulsion has increased.

Automotive propulsion development in Northern Ostrobothnia					(Finnish Transport and Communications Agency)
2018–2023					
Propulsion	2018 Q1	2023 Q3	Change (pcs)	Percentage of propulsion in 2023	Emission factor (g/km)
All cars, pcs	226,896	244,638	17,742	100	
Petrol	123,482	125,486	2,004	51	140
Diesel	102,780	107,021	4,241	44	121
Electric or hybrid	363	10,914	10,551	4.5	0
Natural gas or hybrid	57	918	861	0.4	60.4
Petrol/ethanol	196	288	92	0.04	Ethanol 27

[A propulsion-based calculation model for road transport emissions and the potential for propulsion changes](#)

[Draft Northern Transport Strategy 17 January 2024](#)

[Oulu Region Transport System Plan 2040 process](#)

## 3. Low-emission transport

### 1. Low-emission means of transport & 2. Renewable fuels

#### Regional renewable fuels programme

Increasing the use of renewable fuels requires good availability of the fuels as well as the vehicles that use them. The preparation of a development programme for the use, production and distribution of products that goes well beyond sectoral boundaries is a prerequisite for taking this forward.

#### Accessibility of electric car transport

A regional roadmap will be drawn up for the high-speed charging station network along the main and tourist roads, which plays a key role in the accessibility of electricity charging for electric transport, in conjunction with other roadside services as well as the basic charging possibilities for municipal centres, tourist centres and national parks.

#### Low-emission means of public transport

The public sector's own vehicles and outsourced transport services have an emission reduction potential of approximately 2% of the region's total transport emissions. In addition to absolute emission reductions, the state and municipal vehicle choices also have a significant image and exemplary effect.

### 3. Sustainable mobility & 4. Efficient freight transport

#### Transport system planning based on the latest information

The cross-cutting objective of transport system planning is to reduce emissions in accordance with the commitments. Continuous planning based on the latest information is being carried out in Northern Ostrobothnia and more specifically in the Oulu region. Assessment methods that take climate considerations into account are being developed and used for the production of data.

#### Sustainable mobility infrastructure and services

Sustainable long-distance and short-distance mobility also requires infrastructure and services for the smooth and competitive mobility of passengers and goods. The development of sustainable infrastructure is a key priority in planning and influencing the transport system. Municipalities are becoming active in making effective use of the state aid for sustainable mobility infrastructure.

#### Routes and terminals for transporting bioeconomy and circular economy masses

Efficient logistics are key to the viability of the bioeconomy and circular economy sectors. The prioritisation of road maintenance and development will be prepared from the point of view of the above-mentioned industries and other industries using the lower-level road network.

### 5. Reducing mobility needs through cross-sectoral cooperation

#### Land use and service structure

Land-use planning and the placement of housing, services and jobs can best reduce the need for mobility and contribute to achieving sustainable mobility. This is made possible by a dense community structure in the centres, strong consideration of the need for mobility and accessibility in land-use and service-network planning and decision-making. Northern conditions impose special requirements on the year-round functionality of the community structure and the road network.

#### Sustainable mobility infrastructure and services

Sustainable long-distance and short-distance mobility also requires infrastructure and services for the smooth and competitive mobility of passengers and goods. The development of sustainable infrastructure is a key priority in planning and influencing the transport system. Municipalities are becoming active in making effective use of the state aid provided for sustainable mobility infrastructure.

#### Remote services and location-independent work

Reliable and high-speed broadband enables access to services as well as equal and equal participation in society, regardless of the location and social status. Telecommunications connections make it possible to reduce the need for mobility, for example by remote working and remote services.





## 4. Agriculture becomes a better carbon sequester

Northern Ostrobothnia is a nationally important agricultural region. In the food chain of the area, you can see Finland in miniature. The main production lines are beef and milk production. In the area of fells of the northernmost parts, a significant industry is reindeer husbandry as well as fishing and natural products throughout the area. In crops, potato cultivation is characteristic of the region.

The organic farms are among the largest in the country in terms of surface area.

The goal in the region is clean food and the wellbeing of animals, producers and the environment. It is also in the farmers’ best interest to try to reduce greenhouse gas emissions from agriculture. Agriculture already plays an essential role in climate change mitigation as a carbon sequester. Agriculture will become an increasingly important carbon sink in the future.

When examining the climate impact of agriculture, it is important to take into account the following:

Agriculture produces the majority of human food and binds atmospheric carbon	Assessment and calculation of carbon sequestration of greenhouse gas emissions	Northern Ostrobothnia’s bogs and peatlands	New business opportunities
<p>Consumers’ dietary choices, food intake and food waste are directly linked to the level of greenhouse gas emissions from agriculture.</p> <p>Agriculture sequesters atmospheric carbon to produce food for humans.</p>	<p>There is still a great deal of uncertainty in the calculation and assessment of greenhouse gas emissions and carbon sequestration, particularly in agriculture, land use, land use change and forestry (LULUCF).</p> <p>Resources are needed for research into emissions and carbon sequestration as well as for the refinement and verification of the evaluation so that the actual emissions amount can be reliably estimated in different sectors.</p>	<p>In Northern Ostrobothnia, bogs are a significant part of the landscape.</p> <p>The area’s arable land is 30.5% organic soil, 17.7% humus soil and 12.8% peat soil (Luke 17/2018).</p> <p><b>Greenhouse gas emissions from agriculture in Northern Ostrobothnia in 2022 were 1,024 kt CO<sub>2</sub>e. The figures do not take into account the carbon sequestration of agriculture.</b></p>	<p>Agriculture plays an important role and involves important opportunities for climate change mitigation.</p> <p>Agriculture becoming better at sequestering carbon and producing renewable energy will create new business opportunities for agriculture in the region.</p>



## 4. Agriculture becomes a better carbon sequester

### 1. Growing new crops for new diets, new sources of protein

- Developing the environmental and climate action of livestock production
  - Sources of protein for the future
  - Protein self-sufficient production
    - Increasing plant protein crop production
    - Mushroom production
    - Insect proteins
  - Crop rotation
  - Nitrogen self-sufficiency
- MY, P, L, O, OS, S

### 2. Promoting resource efficiency in agriculture

- Appropriate use of fields
  - Cooperation between farms
  - Digital development and utilisation
  - Prevention of nutrient leakage
  - More efficient land use
  - Biogas plants and nutrient cycle
  - Renewable energy on farms
  - Strategic planning of the premises
  - Utilising drones
  - Energy sources of non-road mobile machinery
- MY, P, L, O, OS, OY, C, M, S, ELY, PPL

### 3. Strengthening soil carbon sinks and carbon farming

- Ensuring vegetation cover
  - Soil fertility
  - Addition of organic matter to the soil
  - Utilising biochar
  - Reduced tillage
  - Growing/favouring perennial carbon sequestration plants
  - Agroforestry
  - Development of grassland farming
  - Commercialisation of crops
  - Strengthening organic production
  - Forestation of idle lands
  - Restoration
- MY, P, L, O, OS, MK, S

### 4. Sustainable use of biofractions and side streams

- Agroecological models applied to the area
  - Energy crop cultivation possibilities are investigated in decommissioned peat bogs
  - Utilisation of food industry side streams
  - Fractionation of manure and biogas plant reject
  - Capture, utilisation and technological development of the carbon dioxide contained in biogas
  - Improving security of supply; reducing the use of fossil fuels in non-road mobile machinery
  - New business models for manure spreading and for minimising spreading losses
- MY, P, L, O, OY, C, M, MK, S, ELY, PPL

### 5. Making peatland cultivation more environmentally friendly

- Adjustment drainage, its maintenance and automation as well as other means of water level control
  - Long-term grass cover
  - Perennial crop species suitable for peat soil and vegetation cover or direct sowing on annual crops
  - Rational use of existing arable land so that new peatlands do not have to be cleared
  - Arrangement of long-term monitoring
  - Regular redefinition of the organic soils
- M, Y, P, L, O, OS, S

**Parties responsible:** MY Rural entrepreneurs, P ProAgria, L Luke, O Oulu UAS, OS OSAO, OY University of Oulu, C Centria, M MTK, MK Forest Centre, S Finnish Environment Institute, ELY: ELY Centre, PPL: Council of Oulu Region



## 4. Agriculture becomes a better carbon sequester

In addition to the impact of agricultural climate action, the study examined the regional economic impact of utilising agricultural side streams in terms of the transport biogas potential of animal manure on farms in Northern Ostrobothnia.

**The value of methane from manure in transport use was approximately EUR 50 million in 2018 and approximately EUR 48 million in 2030.**

In addition, manure has value as a fertiliser. Biogas is also used in the production of heat and electricity.

Scenario review on the sustainable utilisation of agricultural biofractions and side streams as well as the impact of measures in Northern Ostrobothnia

### Development of greenhouse gas emissions from agriculture in Northern Ostrobothnia with resource flow model scenarios: Change from 2018

1. Baseline, as a continuation of current policies: -7.3%
2. In accordance with national development, significant measures are being taken to reduce greenhouse gas emissions: -23.1%
3. Emission trends that take into account the specific features of Northern Ostrobothnia: -45.2%

The course of action is clear. The more strongly measures are implemented, the greater their impact will be on agricultural greenhouse gas emissions.

Identified scenario-based actions, to which Northern Ostrobothnia has the ability and facilities to respond, were found in roadmap workshops and they are policies of the key theme of agriculture. The actions will be carried out in such a way that Northern Ostrobothnia's agriculture as a livelihood remains viable.

For the scenario analysis, greenhouse gas emissions from Northern Ostrobothnia's agriculture were calculated according to the Resource Flow Model, so the LULUCF sector and energy consumption were also taken into account.



## 4. Utilisation of agricultural side streams – biogas projects

The utilisation of agricultural side streams supports the circular economy and reduces greenhouse gas emissions in several ways:

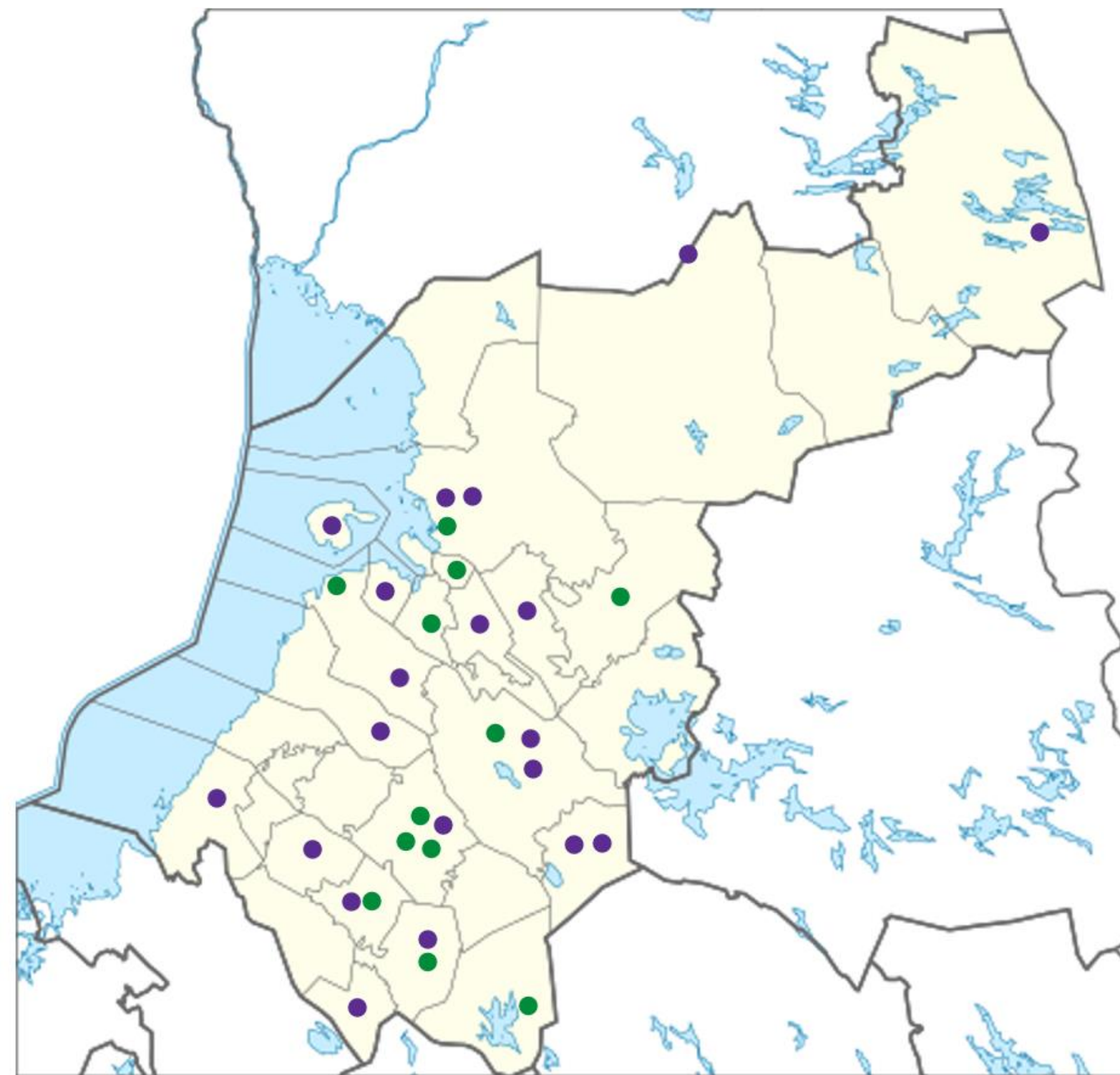
Biogas used as energy reduces the need for fossil fuels, the residue of biogas plants reduces the need for artificial fertilisers, and the cultivation of perennial field biomass used as feed for biogas plants reduces greenhouse gas emissions from the soil.

### Biogas plants in Northern Ostrobothnia at the end of 2023

- Completed biogas plants;  
energy production about 58,000 MWh/year.
- Planned biogas plants;  
energy production about 670,000 MWh/year.

The facilities of individual farms, joint facilities of farms and business facilities are included.

[https://oamk.fi/wp-content/uploads/2023/12/BioKaMa\\_Loppuraportti.pdf](https://oamk.fi/wp-content/uploads/2023/12/BioKaMa_Loppuraportti.pdf)



## 5. Land use is climate-smart and conducive to the circular economy

Proactive and prudent land-use planning significantly contributes to the reduction of greenhouse gas emissions in all emission sectors.

The **comprehensive reform of the Land Use and Building Act** started in 2018. The **Building Act** was adopted on 1 March 2023 and will enter into force on 1 January 2025. At the same time, the section on building in the Land Use and Building Act will be repealed, and the name of the remaining act will be changed to the Land Use Act. The **legislation on land use** is being reformed in accordance with the Programme of Prime Minister Petteri Orpo's Government. The aim of the reform of the Land Use Act is, among other things, to promote the fluency of land use planning, a good living environment, the growth of cities and municipalities, the vitality of regions, the competitiveness of companies and the attractiveness of Finland as an investment target. The aim is for the Government to be able to submit a draft Land Use Act to Parliament in the spring of 2025.

The new Building Act comprehensively brings the fight against climate change into construction legislation. The act streamlines construction, accelerates the circular economy and digitalisation as well as improves the quality of construction. The act directs the construction to be low-carbon, that is, to take into account the climate hazards and benefits generated during the entire lifecycle of the building.

Construction plays an important role in combating climate change. Half of the world's raw materials are used in the construction sector. In building management, climate change is combatted by low-carbon construction and by extending the lifespan of buildings. The design of buildings requires the calculation of the carbon footprint and the determination of the target technical service life of the building, taking into account the use and maintenance of the building. Promoting the circular economy facilitates the reuse and recycling of construction products. Openings by the Digitalisation Division related to the digitalisation of the Land Use and Building Act reform (such as data model-based construction and land use planning and machine readability) will enable more precise control and monitoring of new construction, particularly in the future.

Land use planning must contribute to climate change mitigation by

- 1) strengthening the integrity of the community structure and making sustainable use of existing infrastructure,
- 2) supporting resource-efficient community development and creating the conditions for a low-carbon and sustainable transport system and
- 3) creating the conditions for the exploitation of renewable and low-carbon energy sources.

Land use planning and construction must anticipate the increasing extreme weather phenomena and other changes and risks caused by climate change and ensure the preservation of ecological links. New construction must be located outside the flood risk areas, or flood risk management must otherwise be ensured.

<https://ym.fi/en/land-use-and-building-act>

<https://mrluudistus.fi/>

<https://ym.fi/rakentamislaki>

<https://ym.fi/alueidenkayton-lainsaadannon-uudistus>

[Tools for planning and building a sustainable built environment, Green Building Council Finland's \(GBC Finland\) open and updated portal](#)

[Real estate association RAKLI low-carbon roadmap](#)

Increasing the use of wood in construction contributes to the climate objectives of the national energy and climate strategy. Ministry of the Environment [Wood Building Programme \(2016–2023\)](#).



## 5. Land use is climate-smart and conducive to the circular economy

### 1. Regional reserves for renewable energy production with carbon sinks

The phased regional planning process for the energy and climate plan of Northern Ostrobothnia is under way. Based on the studies of the TUULI project, the proposal of the authorities for the new formula shows a total of 61 new wind farm areas, five of which are offshore. In addition, the plan examines the markings of the wind farm areas of the legally valid phased plans, from which 48 legally valid markings located onshore remain. A lot of local wind power has been built in the region outside the regional plan markings.

The climate impacts of wind power production, taking into account carbon sinks and carbon stocks, have been assessed in the EMMI project.

The purpose of maritime spatial planning is to promote the sustainable development and growth of the various uses of maritime space, the sustainable use of marine resources and the achievement of a good environmental status of the marine environment (section 67s of the Land Use and Building Act). The Maritime Spatial Plan has identified potential areas for the development of offshore wind power in Finland's territorial waters and exclusive economic zone.

### 2. Land-use conditions for low-carbon mobility

Improving the integrity of the community structure and infill development.

Reliance on the existing infrastructure and its sustainable use at all levels of planning. Bicycle and pedestrian transport and local services in and between centres and sub-centres.

[Development image 2030+ of the Oulu city region](#) will be drawn up as part of the MAL agreement on land use, housing and transport. An interface for low-carbon mobility, including opportunities for rail transport in land use development.

### 3. Climate objectives and biodiversity at the heart of member municipalities' land policy

As part of the TUULI project, the regional survey on the green structure and ecosystem services creates the conditions for preserving climate benefits and carbon sinks as part of land use planning.

Green and climate coefficients in municipal plans. Interfaces between agriculture and forestry as well as municipal project planning must be taken into account. Municipal climate plans as part of municipal strategies.

### 4. Climate-smart and low-carbon construction – the right material in the right place and with the right construction

Further development of regional expertise and dialogue in ecological and renovation construction, establishing a link between traditional and modern construction and building sustainably. Consider the entire lifespan of the building from land-use planning onwards. Creating better conditions for the sector to operate with public steering and support (public procurement, education, increasing knowledge/architecture and industry). *Let us be proud of our expertise and take care of our positive image!*

The reform of the Land Use and Building Act takes a stand on low carbon emissions, life cycle characteristics and technical requirements in building management. The design of buildings requires the calculation of the carbon footprint and the determination of the target technical service life of the building; promoting the circular economy facilitates the reuse and recycling of construction products.

### 5. Identification of cross-sectoral opportunities and symbiosis and the circular economy

Development of soil management and mass economy at the regional and urban level.

New innovations and pilot projects will be stimulated by financial engineering and multisectoral RDI activities. Hybrid construction and modularity.

Development of renovation construction on the terms of old construction methods.

### 6. Minimising the decline of forestry land when implementing transport, construction and energy production solutions

Forestry land will be used carefully in new construction, as the carbon sink effect of forests will only increase in a growing forest. It should be noted that land use changes also have wider impacts on the environment and biodiversity.

#### Parties responsible:

Municipalities (planning, land policy, building control), the Council of Oulu Region (regional planning, transport system planning, financing), ELY, ministries, construction industry, RAKLI, R&D/university and educational institutes, energy and electricity transmission companies



# 6. Forests and bogs act as efficient carbon sinks

The Northern Ostrobothnia Regional Forest Programme (AMO) 2021–2025 provides guidelines for the management and protection of the region’s forests, wood use and further processing as well as other use of forests. The aim is to make full and sustainable use of the growing potential of the forests of Northern Ostrobothnia.

The three strategic priorities of the programme are:

- to promote forest growth, carbon sequestration and the improvement of natural and water management status through forest sector solutions and measures;
- to use the region’s forests and their products and ecosystem services in an active, economically, ecologically, socially and culturally sustainable way; and
- to seek new information for the forest sector through research and new methods through development and to strengthen the forest competence of professionals, forest owners and young people.

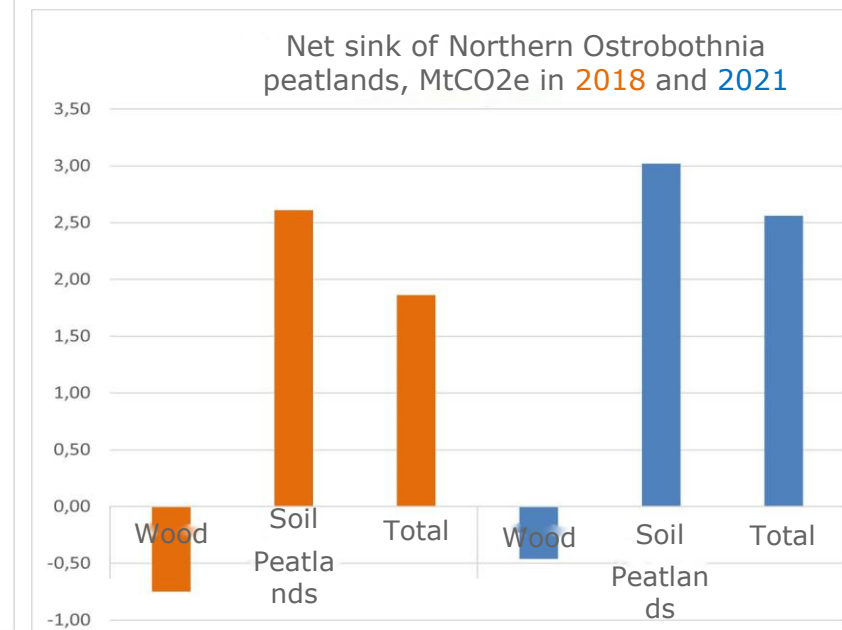
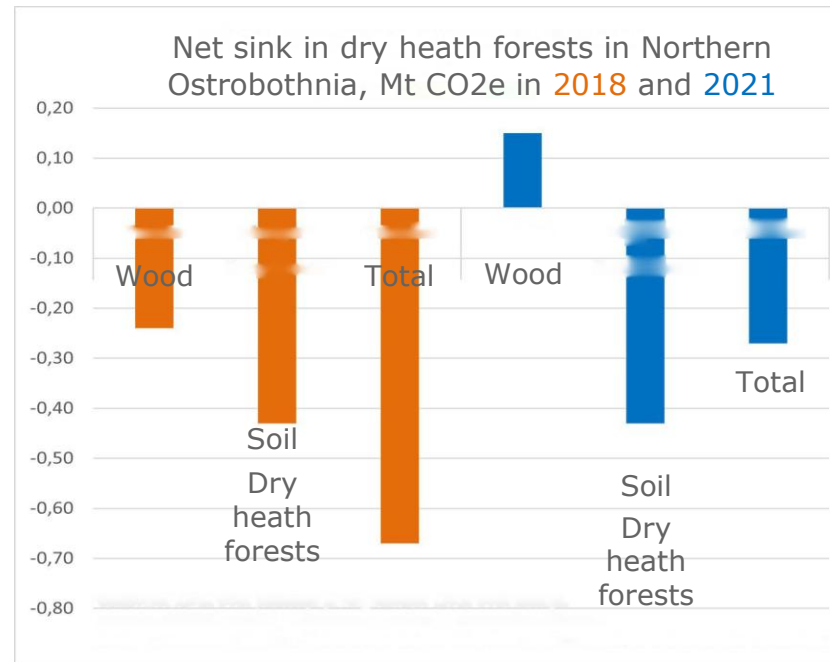
Climate sustainable forestry is one of the ten development themes of the regional forest programme.

- In wood production, opportunities and methods to increase carbon sequestration and reduce carbon release are identified and utilised.
- The conservation of forest carbon stocks and biodiversity is supported through nature management measures.
- Wood replaces fossil raw materials in the manufacture, construction and energy production of products.
- Utilisation of long-lived wood products

The National Forest Strategy 2035 (NFS2035) entered into force from the beginning of 2023. The Northern Ostrobothnia Forest Council introduced new and refined measures to the Northern Ostrobothnia Forest Programme that complement the objectives and measures of the following project portfolios and their themes: Forest growth, Biodiversity in commercial forests and Renewal and competitiveness of the forest sector.

Northern Ostrobothnia:

- Forest stand grows 10.2 Mm<sup>3</sup> and felling removes approximately 8.4 Mm<sup>3</sup> of trunk trees per year (in 2022).
- Region with the most bogs in Finland: about 50% of forestry land is peatland.
- Forestry and the forest industry are a major employer in the region – carbon sinks, long-term carbon sequestration products for the region and for export, regional energy.
- Properly exploited forests are a versatile resource.



The annual carbon sink of the tree stand has been calculated in accordance with the LULUCF-sector methodology of the National Greenhouse Gas Inventory as the difference between biomass growth and removal.

In dry heath forests, timber is an emission source as a result of record-high felling volumes in 2021.

Positive numbers are emissions and negative numbers are sinks. The calculation includes the carbon sinks of the forest and the trees and soil in forest land of low productivity. Source:

Experimental statistics: Forests’ net carbon sink by region | Natural Resources Institute Finland (luke.fi)

Northern Ostrobothnia’s forests									
Timeline	2016-2025			2026-2035			2036-2045		
Scenario	NT	SY	TH	NT	SY	TH	NT	SY	TH
GHG balance Mt CO2e/yr	1,0 Emission	-2,0 Sink	-4,9	0,7	-1,3	-6,0	2,2	-1,1	-6,8

NT: maximum net yield harvesting potential;  
 SY: maximum sustainably maintained logging outturn of merchantable and energy wood;  
 TH: felling at the current levels  
 GHG: greenhouse gas  
 VMI12 (2014–2018) MELA Group 12 February 2020

## 6. Forests and bogs act as efficient carbon sinks

### 1. Forest management in the context of climate change mitigation and adaptation and long-lived wood products

- National forest management recommendations and regional forest programme guidelines for climate-friendly forestry are taken into account
- Preservation of forest carbon stocks and biodiversity
- Wood as a substitute for fossil raw materials
- Long-lived wood products
- Ash fertilisation to promote tree growth
- Forest water management on peatlands

### 2. Increasing forest carbon sinks – new technologies

- Application of artificial intelligence in the calculation of forest carbon balance in wood supply chains (RDI and companies in the development of a wood monitoring system)
- Development and utilisation of soil analytics for growth optimisation (ash fertilisation development, sawdust as a fertiliser, needle imaging)
- Yoda tool to support participatory planning and multi-targeted decision-making, for example in the selection of areas for logging, conservation or recreation.
- Coverage and aggregation of forest, nature, soil and water data from remote sounding

### 3. Restoration of bogs and increase of the carbon sink effects of bogs – based on a needs and impact assessment

- Suitability of bogs for restoration based on information (water system, climate, nutrients, diversity, Yoda tool)
- Experiments with new technologies/pilots for water balance management
- Reducing drainage

### 4. Alternative uses of peat and active influencing

- Promoting technological development, piloting and new business required to raise the level of processing:

Utilisation of surface bogs from bogs that have lost their natural state: as a growth medium, in the textile industry, as insulation, as health and wellbeing products

### 5. Future use of peat-producing areas

- The JTF funds projects that promote alternative livelihoods to peat production areas.
- Mapping of abandoned and idle areas, nutrient economy analysis and identification of the most potential uses (cost-efficiency)
- Forestation of idle areas

#### Parties responsible:

Rural entrepreneurs, ProAgria, Finnish Environment Institute, Luke, Oulu UAS, OSAO, University of Oulu, Central Union of Agricultural Producers and Forest Owners (MTK), Forest Centre, companies, funders

In 2018, the forests of Northern Ostrobothnia sequestered 1.8 million t CO<sub>2</sub>e of greenhouse gas emissions. In 2021, they sequestered 1.7 Mt CO<sub>2</sub>e.

**Greenhouse gas emissions from the energy use of peat in the region in 2018 were 820 kt CO<sub>2</sub>e.**

**Due to the reduced energy use of peat, emissions decreased by about 527 kt CO<sub>2</sub>e by 2021 to 293 kt CO<sub>2</sub>e.**

**Use of woody biomass in energy production as a result of peat substitution could grow by about 0.7–0.9 Mm<sup>3</sup> by 2035.**

**- The estimated maximum sustained logging outturn of forest processed chips at the end of the review period exceeds the current use of 1.7 Mm<sup>3</sup>, which would be sufficient to cover the growing demand.**

**- However, the utilisation rate should be significantly increased from the current level and the sufficiency of harvest chains may become a challenge.**

Report on the development of peat energy use and effects on the wood supply chain and greenhouse gas emissions in Northern Ostrobothnia





## 7. Cooperation and cross-sectoral operating models create vitality and business opportunities

*Comprehensive cooperation between all sectors is needed to mitigate and adapt to climate change. Technological expertise alone is not enough. New kinds of business expertise, communication, interaction and training are needed.*

### 1. Cross-sectoral cooperation actively promoted

- Integrating the ICT sector into the solution of climate challenges
  - Utilising the region's big data expertise
  - Cooperation between companies, the public sector and the third sector
  - Culture as a driver of climate action
- L, O, OY, C, OL, Y, MK, ELY, KE, S, PPL, K, KS

### 2. Active use of new sources of funding, prioritisation and steering of funding in line with the climate strategy

- Strategic portfolio construction as well as a support and monitoring model for strategic projects
  - Implementation of a financial designer service
  - Support for change in business operations
- O, OY, C, Y, MK, ELY, KE, PPL, K

### 3. Supporting the low-carbon food chain

- Reducing food waste throughout the food chain
  - Promoting the transition to low-carbon diets based on local food (more plant-based diets, new sources of protein, security of supply and vitality of the region)
  - Optimising food chain transports
- L, O, OY, C, OL, Y, MK, ELY, KE, S, PPL, K, KS

### 4. The region as a development platform and promoter of climate action

- Corporate climate programme
  - Commercialisation, scaling and export promotion of low-carbon, saving of energy and materials, innovations based on bioeconomy and the circular economy
  - Pilots and experimental projects
  - Utilising young people's innovation capacity
- L, O, OY, C, OL, Y, MK, ELY, KE, S, PPL, K, KS, YY

### 5. Promoting education, training, information and communication on the bioeconomy, circular economy and climate issues

- Effective communication of the region's climate strategy to all stakeholders. Connection to sector-specific networks
  - The best practices of the pioneering municipalities of Finland will be implemented as widely as possible
  - Training, counselling and competence building for different needs
  - Example projects made visible, impact communication clear, benefits and synergies highlighted
  - Civic interaction
- L, O, OY, C, OL, Y, MK, ELY, KE, S, PPL, K, KS

### 6. Public procurement processes reformed

- Environmental impacts and circular economy as procurement criteria and encouraging them
- L, O, OY, C, OL, Y, MK, ELY, KE, S, PPL, K, KS

**Parties responsible:** L: LUKE, O: Oulu UAS, OY: University of Oulu, C: Centria, OL: Educational institutes, Y: Companies, MK: Finnish Forest Centre, ELY: ELY Centre, KE: Municipal enterprises, S: Syke, PPL: Council of Oulu Region, K: Municipalities, KS: Third sector, YY: Entrepreneur associations



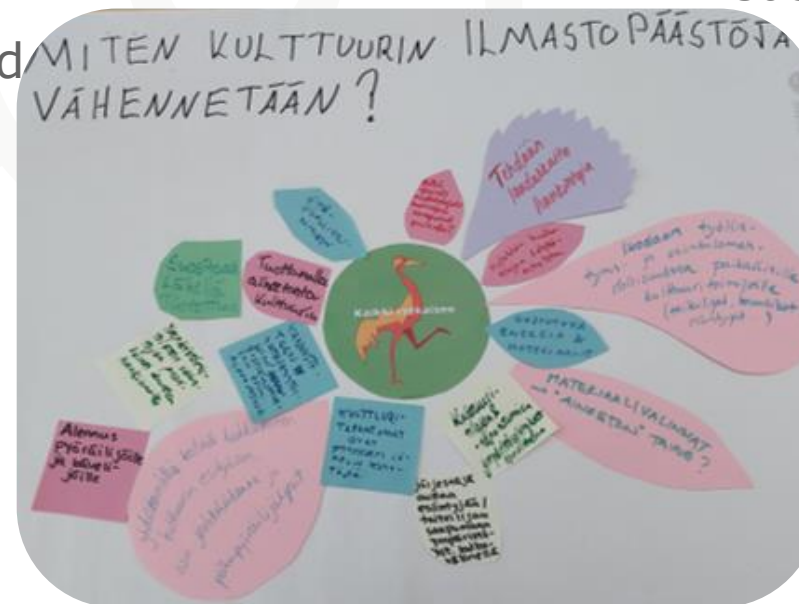
# 7. Cooperation and cross-sectoral operating models create vitality and business opportunities

## Reducing climate emissions from culture

- prioritising climate-friendly choices and taking the circular economy into account in operations
- sustainable procurements
- increasing the efficiency of logistics
- immaterial culture and art
- local services and local culture
- incentive schemes for low-emission methods
- remote participation opportunities
- premises, energy saving and renewable energy solutions
- reducing the emissions and carbon footprint of events and procurements

## Culture as a driver of climate action

- increasing interactivity and inclusion
- open discussion
- changing the climate of values and attitudes by means of culture
- communication, statements and information
- duplicating good practices
- sustainability criteria for financing
- strengthening relationships with nature
- sustainable models from history



# 7. Cooperation and cross-sectoral operating models create vitality and business opportunities

## Views of young people

### What are the most important actions in Northern Ostrobothnia's climate work?

- Improving public transport and cycling routes in the region
- Nature conservation
- Strengthening carbon sinks, e.g. planting seedlings
- Increasing quality local services and companies' environmental friendliness
- Improving energy efficiency and exploiting renewable energy sources
- Plant-based diet and reduction of food waste
- Participation of young people in decision-making

### What kind of climate actions would you be prepared for?

- Doing small things every day, doing everything I can
- Ride-sharing and public transport use
- Reducing travel, human-powered mobility
- Recycling more and consuming less
- Avoiding fast fashion and choosing domestic products
- Favouring vegetarian food

Small things  
every day,  
everything  
I can



What is your favourite type of nature in your municipality?



Northern Ostrobothnia Youth Council 14 December 2023 workshop and young people's answers from spring 2022. Photos: Ritva Isomäki

# 7. Cooperation and cross-sectoral operating models create vitality and business opportunities

## Opinions of organisations

### What are the most important actions in Northern Ostrobothnia's climate work?

- Social sustainability and people-orientation
- Wider cooperation in planning and development
- Maintenance of outdoor and local hiking routes
- Energy-efficiency and consumption reduction
- A fair green transition
- Increasing knowledge and expertise
- Directing funding to climate-friendly projects and investments

### How can your organisation contribute to climate work?

- Easy-to-understand communication and training for reliable information
- Providing a safe space for open discussion
- Financing and implementation of nature and climate projects
- Utilisation of digitalisation and teaching
- Actions: Food aid and utilisation of surplus food, equipment exchanges, use of personal mugs, flea markets, ride-sharing, outdoor activities, crafts, bicycle benefit, paperless activities, recycling, use of aprons
- Cross-generational collaboration

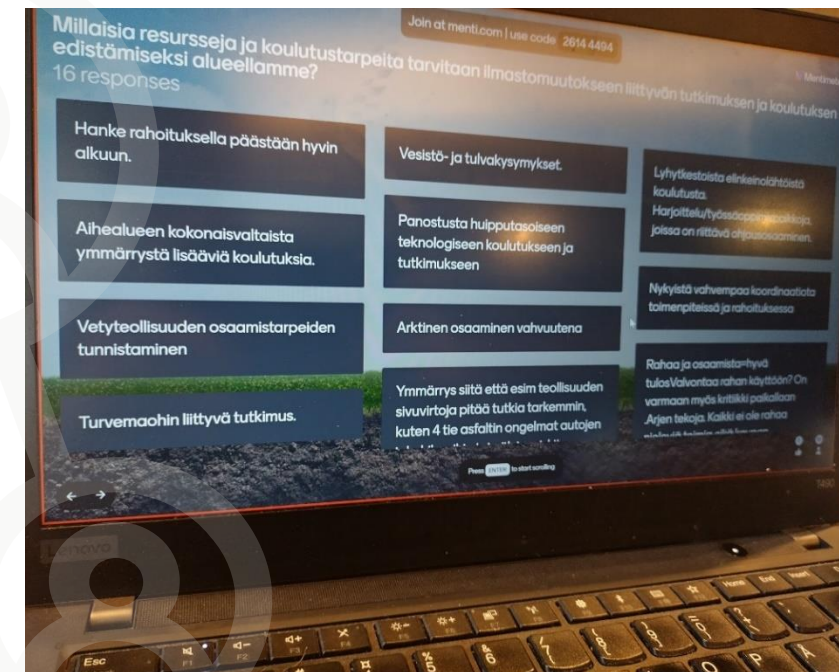


Northern Ostrobothnia advisory board for organisations 5 February 2024 workshop  
Photos: Ritva Isomäki

## 7. Cooperation and cross-sectoral operating models create vitality and business opportunities

### What are the current strengths of education and research in climate change mitigation and adaptation in our region?

- Extensive and high-quality training offer
- High-quality research
- Technology know-how
- Interest, understanding and cooperation on the topic
- Arctic expertise
- Active expert and development work
- Youth region



Northern Ostrobothnia cooperation group for education and research workshop 27 February 2024

Photos: Joonas Rukajärvi

### What resources and training are needed to advance climate change research and education in our region?

- Training to increase the overall understanding of the subject area
- Stronger coordination of actions and funding
- Identification of competence needs, such as arctic know-how, hydrogen industry, safe utilisation of side streams, water and flood issues as well as land use
- Agile training for clean/green transition investments
- Strengthening corporate cooperation
- Nordic, cross-border and international cooperation brings competence and resources



# Adaptation

*Adaptation to climate change will prevent or mitigate the negative impacts of change and capitalise on the positive impacts of change.*

## **Adaptation measures specifically affecting Northern Ostrobothnia**

- Implementing contingency and preparedness plans for each municipality
- Development of irrigation systems and water management in fields
- Protecting energy and water distribution in extreme weather events
- Improved flood and rainwater management
- Proactive land use planning
- Use of new opportunities in agriculture and securing the food supply also outside the region
- Diversifying production to improve agricultural adaptability, production and security of supply
- Preventing forest fires and developing effective fire extinguishing
- Increasing areas of vegetation cover
- Promoting business opportunities related to adaptation
- Investment in disease control in plants, animals and humans
- More effective communication on adaptation to climate change
- Creating adaptation networks
- Ensuring adaptation research, development and education
- Following and participating in national and international adaptation work
- Ensuring biodiversity requires cooperation at the municipal and regional level
- Preventing the health impacts of climate change and minimising harm



- Key factors for adapting to climate change in land use:
- Preparing for increasing storms, heavy rainfall and urban floods and other changes and risks caused by climate change
  - Construction mainly outside flood risk areas
  - Safeguarding ecological links relevant to the migration of species
  - Utilising the green environment in urban planning

Adaptation to climate change was already taken into account in the climate strategy prepared for Northern Ostrobothnia in 2010. Today, it is more relevant than ever.

For example, Kuusamo and Ylivieska are preparing a plan for adapting to climate change.

The national climate unit of ELY Centres is responsible for the implementation of the National Climate Change Adaptation Plan (KISS 2030) and the tasks related to the implementation of the Climate Plan for the Land Use Sector (MISU 2035).

# Towards a carbon neutral Northern Ostrobothnia

## Key themes of Northern Ostrobothnia's climate action – Everything matters

### 1. Smart bioeconomy and the circular economy underpin climate action

1. Production and use of biogas promoted, taking into account the nutrient cycle and environmental impacts
2. Natural resources – development of sustainable products and business
3. Wood construction promoted as part of climate-friendly construction
4. Coordinated use of soil, rock and recycled materials in accordance with the circular economy
5. Utilisation of ICT expertise
6. Waste and side streams recycled and recovered
7. Carbon capture and storage

### 2. Sustainable, efficient and low-emission energy production and use

1. Renewable energy production replacing fossil energy promoted based on the region's strengths
2. Developing a low-emission, efficient and flexible energy system
3. Supporting energy efficiency and low emissions

### 3. Low-emission transport

1. Low emission means of transport & 2. Renewable fuels  
Regional renewable fuels programme  
Accessibility of electric car transport  
Low-emission means of public transport

3. Sustainable mobility & 4. Efficient freight transport  
Transport system planning based on the latest information  
Sustainable mobility infrastructure and services  
Routes and terminals for transporting bioeconomy and circular economy masses

5. Reducing mobility needs through cross-sectoral cooperation  
Land use and service structure  
Remote services and location-independent work

### Adaptation as part of key themes

### 4. Agriculture becomes a better carbon sequester

1. Cultivation of new plants for new diets, new sources of protein
2. Promoting resource efficiency in agriculture
3. Strengthening soil carbon sink and carbon farming
4. Sustainable use of biofractions and side streams
5. Making peatland cultivation more environmentally friendly

### 5. Land use is climate-smart and conducive to the circular economy

1. Regional reserves for renewable energy production with carbon sinks
2. Land-use conditions for low-carbon mobility
3. Climate objectives and biodiversity at the heart of member municipalities' land policy
4. Climate-smart and low-carbon construction – the right material in the right place and with the right construction
5. Identification of cross-sectoral opportunities and symbiosis and the circular economy
6. Minimising the decline of forestry land when implementing transport, construction and energy production solutions

### 6. Forests and bogs act as efficient carbon sinks

1. Forest management in the context of climate change mitigation and adaptation and long-lived wood products
2. Increasing forest carbon sinks – new technologies
3. Restoration of bogs and an increase of the carbon sink effects of bogs – based on a needs and impact assessment
4. Alternative uses of peat and active influencing
5. Future use of peat-producing areas

### 7. Cooperation and cross-sectoral operating models create vitality and business opportunities

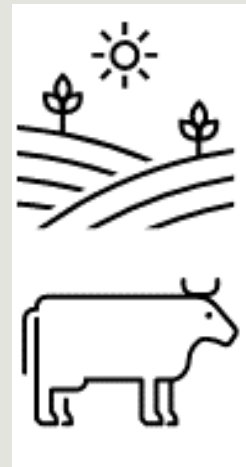
1. Cross-sectoral cooperation actively promoted
2. Active use of new sources of funding, prioritisation and steering of funding in line with the climate strategy
3. Supporting the low-carbon food chain
4. The region as a development platform and promoter of climate action
5. Promoting education, training, information and communication on the bioeconomy, circular economy and climate issues
6. Public procurement processes reformed
7. Culture as a driver of climate action
8. Young people's innovativeness
9. Organisations in climate work





**TRANSPORT**

34% reduction in road transport emissions between 2007 and 2040 through changes in propulsion power: 300 kt CO<sub>2</sub>e



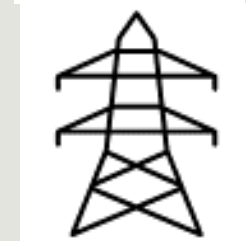
**AGRICULTURE**

23% reduction in agricultural emissions between 2018 and 2030, for example through peatland cultivation changes and renewable energy: about 300 kt CO<sub>2</sub>e



**PEAT**

Reduced energy use of peat will reduce emissions by 700 kt CO<sub>2</sub>e from between 2018 and 2035



**WIND POWER**

Northern Ostrobothnia onshore wind power projects' emission compensation effect:

- in production: about 387 kt CO<sub>2</sub>e
- in planning: more than 2,000 kt CO<sub>2</sub>e,
- including those in study phase: 3,700 kt CO<sub>2</sub>e

## Possibility for large emission reductions

Solutions in the right direction are needed now. Emissions reductions will not happen on their own and visible effects will take decades.

The calculations are based on the scenarios of the surveys carried out in the POPilmasto project. The figures are theoretical and indicative.

For agriculture, the figures have been calculated according to Ramboll's Resource Flow Model, i.e. they are not directly comparable to the ALas-Hinku calculation.

The energy use figures for peat are mainly in the emissions trading sector. Source of wind energy projects: The Finnish Wind Power Association, calculation of the ALas compensation figure, the plan or permit process initiated in the planned project or the wind farm under construction, in the preliminary study phase, the project was identified and published.



# VISION

## Towards a carbon neutral Northern Ostrobothnia

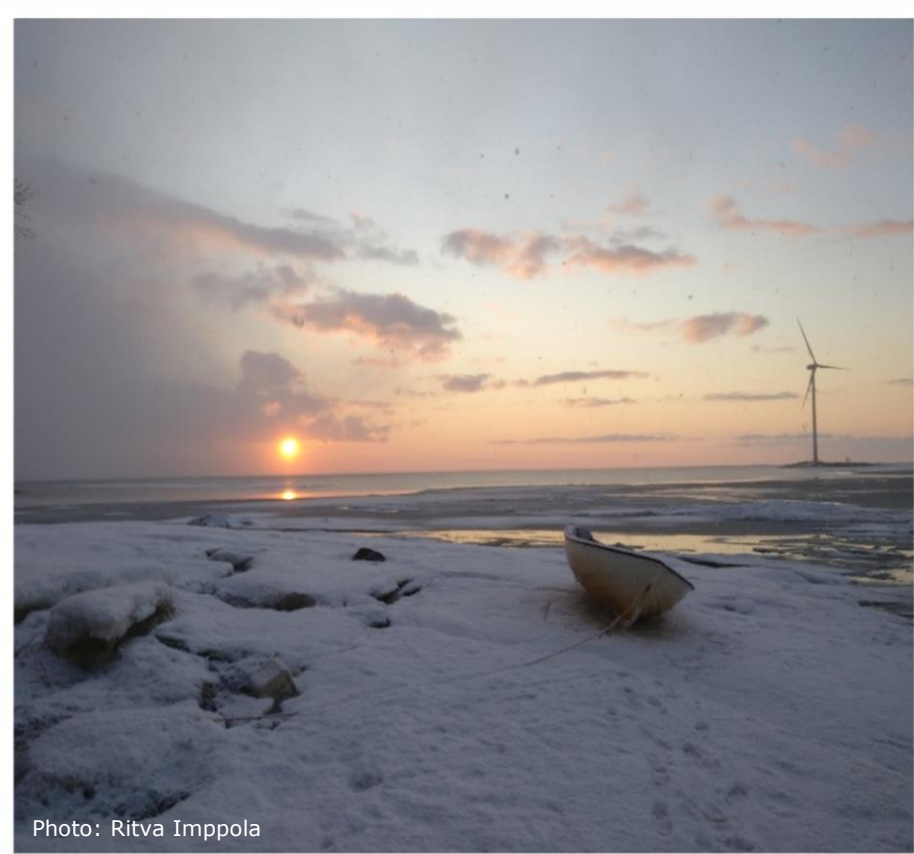


Photo: Ritva Impola



Photo: Ella Isomäki

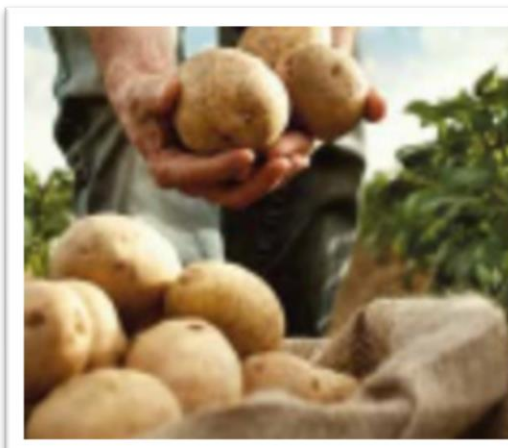
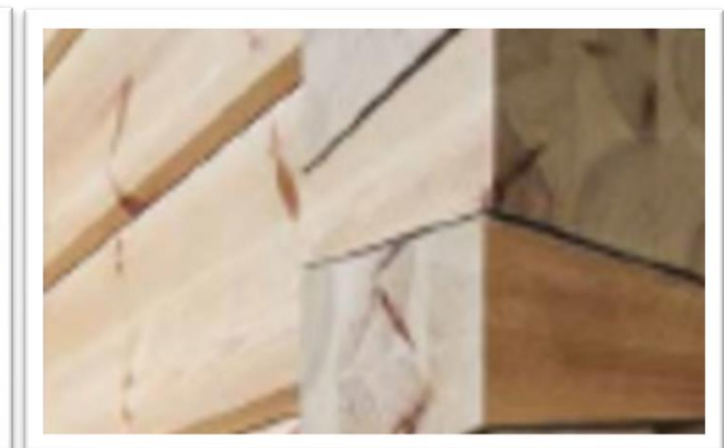


Photo: Finnish Environment Institute



# Implementation and monitoring

- In order to achieve the objectives as set out in broad cooperation, we need shared leadership, commitment and joint action by actors as well as financial resources and the full use of the resources.
- The public sector (municipalities, cities, public authorities), companies, RDI organisations, non-profit organisations and residents are all part of the climate action: promoting, supporting and implementing.
- The EU's Green Deal, EU regional and structural policy programmes and national funding allocate significant resources to climate action.
- Climate objectives are an essential part of the development of the region and the planning of land use.
- The region's climate objectives support not only climate mitigation, adaptation and biodiversity conservation, but also the regional economy.
- The climate roadmap has been drawn up in broad cooperation. The roadmap provides guidelines for the development of the operating environment so that the sector's developer organisations can allocate their resources correctly. Companies make their own strategic decisions and choices on the development and renewal of their business operations while taking into account the business opportunities provided by the operating environment and the high level of RDI support available.

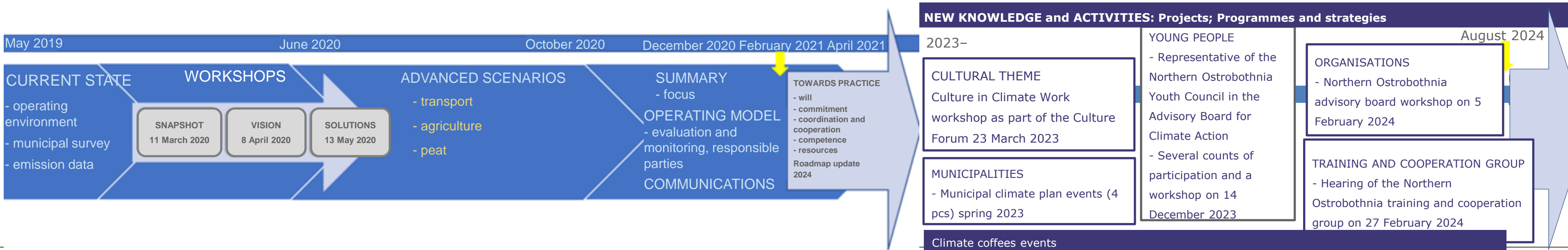
- The Council of Oulu Region coordinates the meetings of the advisory board established by the Board of the Regional Council. The Board of the Regional Council appointed and appointed an advisory board for a second term 2022–2025. Canemure's regional cooperation group has been coordinated with the composition of the advisory board (the project will operate until 2024). The advisory board meets three times a year.
- The calculation of greenhouse gas emissions, which is updated annually by the Finnish Environment Institute, is used to assess the effectiveness of the measures. Updating the roadmap in 2024 is an important part of the effectiveness of implementation and monitoring.
- The established cooperation network will continue its activities in monitoring, promoting, support and implementation of the diverse climate action in the region. In the region, climate work is active and the actors maintain good discourse with each other. Good practices multiply and the challenges are resolved together.
- Successful actions will be communicated in different forums.



\*Innovation and Skills in Finland 2021–2027 EU regional and structural policy programme:

In accordance with the Government's decision, Northern Ostrobothnia will receive a total of EUR 356.4 million in grant authorisations during the programming period 2021–2027. The amount is distributed by fund as follows: European Regional Development Fund (ERDF) EUR 152.7 million, European Social Fund (ESF+) EUR 84.2 million and Just Transition Fund (JTF) EUR 119.4 million. A total of 35% of the ERDF funding must be used for climate action. The projects must support the promotion of the development targets identified in the Northern Ostrobothnia Regional Programme 2022–2025 and its implementation plan, and under Priority 2. Carbon-neutral Finland is aligned with the NOCR.

# APPENDICES



CURRENT STATE	WORKSHOPS - snapshot, vision and solutions	ADVANCED SCENARIOS - transport, agriculture and peat	COMPILATION & OPERATING MODEL	TOWARDS PRACTICE
<p><b>CLIMATE CHANGE HERE AND ABROAD</b></p> <p>The POPilmasto project started in May 2019. Cooperation with the Canemure project was established. The challenges, opportunities, adaptation and preparedness brought about by climate change are a broad entity. Process constraints and overview were specified. In cooperation with the Ministry of the Environment’s Wood Building Programme, a seminar on climate-smart construction was organised on 12 December 2019.</p> <p>A survey was conducted for 30 municipalities in the region to determine the current state of climate action and the planned actions in the coming years. Greenhouse gas emission data calculated by the Finnish Environment Institute for municipalities were analysed. The EU and national operating environment were studied as the basis of the work (Solved – The Cleantech Company Oy and AFRY Management Consulting Oy). The results of the phase were presented in a snapshot workshop on 11 March 2020.</p>	<p><b>INFORMATION, INTERACTION AND COOPERATION</b></p> <p>The Snapshot workshop provided information on the situation as well as the willingness of the 30 municipalities in Northern Ostrobothnia in climate action and the general operating environment in presentations and panel discussions. Challenges and opportunities were discussed. Regional programmes were represented in the working groups: forestry, agriculture, transport, land use and energy. The long-term work and experience of various parties and the opportunities for influence were utilised in the setting of climate objectives and actions. The Vision workshop outlined the region’s climate action and main objective. The Solutions workshop discussed the selected key themes in more detail. The workshops attracted 210 participants from the public sector, companies and organisations. Solved and AFRY Management Consulting Oy facilitated the events.</p>	<p><b>MORE DETAILED INFORMATION</b></p> <p>The NOCR looks like the region itself. Impact studies for the different climate measures were obtained for the sectors most important in terms of climate emissions.</p> <ul style="list-style-type: none"> <li>• Low-emission transport – a propulsion-based calculation model for road transport emissions and the potential for propulsion changes (Sitowise Oy)</li> <li>• Sustainable utilisation of agricultural biofractions and side streams, and impact of measures in Northern Ostrobothnia, a scenario review (Ramboll Finland Oy)</li> <li>• Development of peat energy use in Northern Ostrobothnia, effects on the wood supply chain and greenhouse gas emissions, a report (AFRY Management Consulting Oy)</li> </ul>	<p><b>FOCUS, MONITORING AND EVALUATION, PROMOTION AND RESPONSIBLE PARTIES</b></p> <p>The roadmap, based on the latest information and interaction, contains a description of the current situation, the key themes with measures as well as a model for monitoring and promotion. The established cooperation network will continue its activities in support of the diverse climate action in the region. The Council of Oulu Region, as the regional development authority, coordinates the meetings of the advisory board in cooperation with the Canemure project. The active climate work of the actors in the region is convened three times a year. The greenhouse gas emissions calculation is used in the assessment of the measures and is updated annually by the Finnish Environment Agency.</p>	<p><b>FROM WORDS TO ACTION</b></p> <ul style="list-style-type: none"> <li>- SHARED LEADERSHIP, COMMITMENT, COLLABORATION AND RESOURCES</li> <li>- The roadmap was sent for opinion of the climate steering groups in December 2020. It was approved by the Board of the Regional Council in February 2021. In order to achieve the climate objectives set out in broad cooperation, we need shared leadership, commitment and joint action by actors as well as financial resources and their full use. The EU’s Green Deal, EU structural policy fund programme and national funding allocate significant funding to climate action. Climate objectives are an essential part of the development of the region and the planning of land use.</li> </ul>

**ROADMAP UPDATE:** The work being carried out on updating the climate roadmap started in 2023. The update was submitted on 11 April 2024 with the opinion of the advisory board steering climate work. The roadmap update was approved on 19 August 2024 by the Board of the Regional Council of Northern Ostrobothnia. The work on updating the roadmap produced new information on several themes in different projects. The results of the Innovation and Skills in Finland 2021–2027 programme will be collected in the national project information service at <https://eura2021.fi/hanketietopalvelu>. Municipal climate plans events were held in 2023 on the following: Kuusamo 13 April, Ylivieska 19 April, Sievi 9 May, Kempele 16 May. All municipalities were invited to the events by groups. There were 56 participants from a total of 23 municipalities. The events were thought to be very necessary and topical. They have sparked calls for applications for funding and cooperation for plan preparation. The Culture in Climate Work event on 23 March 2023, which was part of the Culture Forum, had more than 100 participants. In addition, several Climate Coffee events were held.



The photos are from the first workshop on 11 March 2020  
The second and third workshops had a “digital leap” – they were held remotely due to the COVID-19 situation.

## Workshops

The analysis of the operating environment on the basis of the roadmap was carried out by Solved – The Cleantech Company Oy under Janne Hietaniemi and AFRY Management Consulting Oy’s Mira Hulkkonen, Susanna Kiviniemi, Arto Ruotsalainen under Katri Luoma-aho, acting as facilitators and innovators of participatory workshops

The Snapshot workshop on 11 March 2020 provided information on the situation and willingness of the 30 municipalities in Northern Ostrobothnia in climate action and the general operating environment. The panel discussion on regional strengths in a dynamic operating environment was moderated by Santtu Hulkkonen from Solved – The Cleantech Company Oy. The panellists were Pia Erkinheimo, VAKE; Serafima Jolkkonen, student; Marjo Kolehmainen, Pohjois-Pohjanmaan Yrittäjät; Toni Krankkala, NIHAK ry; Jonas Liimatta, ELY Centre; Paula Paajanen, City of Oulu

Tanja Lepistö, East and North Finland EU Office, presented the opportunities and obligations presented by the EU in relation to climate change. Santtu Karhinen, Finnish Environment Institute, spoke about the basis of the emission calculations.

Regional programmes were represented in the groups: forestry, agriculture, transport and land use and energy. The long-term work and experience of various parties and the opportunities for influence were utilised in the setting of climate objectives.

The Vision workshop on 8 April 2020 outlined the region’s climate action and main objective. The Teams meeting was attended by nearly 80 participants from different organisations and speakers Jyri Arponen from Sitra, Sanna Söderlund from the Baltic Sea Action Group and Sanna Davidsainen from Elektrobit.

The Solutions workshop on 13 May 2020 discussed the key themes selected for the region’s climate action and their measures in more detail.

The workshops attracted 210 participants from the public sector, companies and organisations.

## Seminar on climate-smart construction

Land use and housing solutions matter; housing accounts for 33% of our carbon footprint. The carbon spike caused by construction is almost a third of this and, therefore, particular attention must be paid to the early stages of construction and the choice of building materials.

The outcome of the seminar, organised in cooperation with the Ministry of the Environment’s Wood Building Programme on 12 December 2019, is in key theme 5. Land use is climate-smart and conducive to the circular economy, objective 4. Climate-smart and low-carbon construction – The right material in the right place.

Expert panellists:

Antti Erola, JVR Plus Oy; Esa Heikkilä, Finnsementti; Janne Jokelainen, Municipality of Ii; Janne Pihlajaniemi, University of Oulu; Pekka Seppälä, City of Oulu

Warm thanks to everyone!

Why does Northern Ostrobothnia need its own climate roadmap and advisory council to guide the work?

Climate action consists of both political decisions and daily choices by all of us.

What will Northern Ostrobothnia be like in 2035?

The people of the region have been heard on various occasions along the way.

Matias Ojalehto, Chair of the Board of the Regional Council, responds and envisions.  
[Listen to recordings of the workshop on 11 March 2020](#)



The photos show the steering of the climate objectives of Northern Ostrobothnia on 16 May 2019, 23 August 2019 and 24 January 2020. Remote meetings took place on 26 November 2020 and 3 February 2021.



The photos are from the Ilmastoareena ("Climate Arena") event in Ii and the Tyrnävä potato market in 2019.



## **Tasks and composition of the Northern Ostrobothnia Advisory Board for Climate Action**

The Northern Ostrobothnia Advisory Board for Climate Action guides the formation of regional climate and energy goals.

Tasks include

- monitoring the operating environment,
- promoting strategic objectives,
- monitoring the implementation, and
- promoting interaction and cooperation between different actors.

The Advisory Board for Climate Action is a group appointed and appointed by the Board of the Regional Council. The Board of the Regional Council, the office of the Council of Oulu Region and key stakeholders are represented in the advisory board. Close cooperation takes place with the regional Canemure – Towards Carbon Neutral Municipalities and Regions project coordinated by Oulu University of Applied Sciences Ltd.

## 2019–2020 advisory board composition (1st term)

Representatives nominated by the Board of the Regional Council of Northern Ostrobothnia: Chair Matias Ojalehto, Vice-Chair Jari Nahkanen in place of Tytti Tuppurainen, from 9 December 2019  
Pirjo Sirviö, Kalervo Ukkola, Lyly Rajala, Mika Flöjt, Matti Pahkala, Annemari Enojärvi

Organisation	Representative	Deputy representative
Joint Municipal Authority of Haapavesi-Siikalatva Region	Hannu Saarinen from May 2020 Tarja Bäckman, Regional Director	Pauli Piilma, Mayor of Siikalatva
Oulu Chamber of Commerce	Esa Pellikainen, Assistant Managing Director	Maria Juurikka, Director of Service Sector
MTK Pohjois-Suomi ry	Matti Tyhtilä, Executive Director	Sami Nivala
Keski-Pohjanmaan Yrittäjät	Jarmo Nahkala	Antero Kujala
City of Oulu	Maarit Talvitie, Climate Specialist	Jonna Hakala, Environmental Protection Manager
Finnish Environment Institute SYKE	Teemu Ulvi, Research Engineer	Maria Kopsakangas-Savolainen, Research Professor
Northern Ostrobothnia Centre for Economic Development, Transport and the Environment (ELY)	Jonas Liimatta, Director General	Timo Lehtiniemi, Head of Unit
Finnish Association for Nature Conservation, Northern Ostrobothnia chapter	Esko Saari, President	Kalle Hellström, Oulu Nature Conservation Society, Vice President
ProAgria Oulu	Risto Jokela, Specialist	Juha Sohlo, Service Manager
Pohjois-Pohjanmaan Yrittäjät	Marjo Kolehmainen, CEO	Tiina Talala, Procurement Agent, until 29 March 2020
University of Oulu	Eva Pongrácz, Professor	Arja Rautio, University of the Arctic, Vice-President, Research 2nd Deputy Representative Jenni Ylä-Mella, Post-doctoral researcher
Nivala-Haapajärven seutu NIHA ry	Toni Krankkala, CEO	Henrik Kiviniemi, Mayor
Oulunkaari Joint Municipal Authority	Ari Alatossava, Mayor of Ii	Anne Sormunen, Mayor of Utajärvi
Finnish Forest Centre	Eeva-Liisa Repo, Head of Economic Development	Eljas Heikkinen, from 22 September 2020 Anu Hilli, Forest Management Specialist
Naturpolis Oy	Jari Hentilä, CEO	Jukka Kihlman
Oulu UAS	Tuomo Pesola, Head of Education and RDI	Ritva Impola, Project Manager
Ylivieska sub-region	Tapio Koistinaho, Environmental Manager	Timo Kiema, Regional Manager
Natural Resources Institute Finland	Anne Tolvanen, Professor	Oili Tarvainen, Researcher
Oulu Region/Oulu's surrounding municipalities	Ari Alatossava, Mayor of Ii	Aki Heiskanen, Mayor of Hailuoto
Raahe sub-region	Seppo Sorvari, Office Secretary	Vesa Ojanperä, Environmental Secretary
Youth representation	appointed when the Youth Council is organised	

### Responsible manager of the POPilmasto project:

Jussi Rämetsä

### Project Manager:

Ritva Isomäki





## Composition of the Regional Cooperation Group

Haapavesi-Siikalatva sub-region	Hannu Saarinen	
Kalajoki renewable energy park	Not selected	
Koillismaa sub-region and Naturpolis	Jari Hentilä	Anne Tolvanen
Natural Resources Institute Finland	Olli Tarvainen	
Ii Micropolis	Leena Vuotovesi	
MTK Northern Finland	Matti Tyhtilä	
Nivala-Haapajärvi sub-region	Toni Krankkala	
Oulu University of Applied Sciences	Tuomo Pesola	Ollipekka Huotari
City of Oulu	Matti Matinheikki	
Educational Consortium OSAO	Kirsti Joki-Tokola	
Oulu sub-region and Oulunkaari sub-region	Ari Alatossava, Chairman	Arja Rautio
University of Oulu	Eva Pongrácz	
Northern Ostrobothnia ELY Centre	Jonas Liimatta	
Council of Oulu Region	Jussi Rämät	Kalle Hellström
Finnish Association for Nature Conservation, Northern Ostrobothnia chapter	Esko Saari	Juha Sohlo
ProAgria Oulu	Vesa Nuolioja	Vesa Ojanperä
Raahe sub-region	Seppo Sorvari	Eljas Heikkinen
Finnish Forest Centre	Eeva-Liisa Repo, Vice Chair	
Finnish Environment Institute	Raimo Ihme	Timo Kiema
Ylivieska sub-region	Tapio Koistinaho	

## Composition of the Advisory Board for Climate Action in its second term (2022–2025)

Jussi Ylitalo, Chair of the Advisory Board (Chair of the Board of the Regional Council; Esa Aalto, Vice Chair (Member of the Board of the Regional Council, and Ritva Isomäki, Secretary (Council of Oulu Region).

Organisation	Representative	Deputy
Centria University of Applied Sciences	Tomi Pitkäaho, R&D Manager	
Keski-Pohjanmaan Yrittäjät	Jarmo Nahkala	Antero Kujala
Koillis-Suomen kehittämissyhtiö Naturpolis Oy	Jari Hentilä, CEO	Kirsi Kuosku, Regional Development Manager
Educational Consortium OSAO	Kirsti Joki-Tokola, Director of Customer Service	Rauno Hekkala, Member of the OSAO Board
Natural Resources Institute Finland	Anne Tolvanen, Research Professor	Katri Kärkkäinen, Research Professor
Metsähallitus	Pirkko Siikamäki, Community Relations Manager, Metsähallitus Nature Services	Ilkka Herukka, Planning Manager, Metsähallitus Metsätalous Oy, Ostrobothnia-Kainuu
MTK Pohjois-Suomi ry	Hanne Hurskainen, Executive Director	
Nivala-Haapajärvi sub-region	Henrik Kiviniemi, Town Manager of Pyhäjärvi	
Oulu University of Applied Sciences	Sanna Tyni, Lead researcher in the focus area of low-carbon solutions	Outi Virkkula, Principal Lecturer
Oulu Chamber of Commerce	Esa Pellikainen, Assistant Managing Director	Mari Viirelä, Director of Service Sector
City of Oulu	Maarit Talvitie, Climate Specialist	Marko Kilpeläinen, Director of Urban Environment Services
Northern Ostrobothnia ELY Centre	Jonas Liimatta, Director General	Petri Keränen, Director
Pohjois-Pohjanmaan Yrittäjät	Marjo Kolehmainen, Managing Director	
ProAgria Oulu	Vesa Nuolioja, Managing Director	Heini Iinatti, Executive manager at Rural Women's Advisory Organization, Oulu
Finnish Association for Nature Conservation, Northern Ostrobothnia chapter	Esko Saari, President	Kirsi Eskelinen, Secretary
Finnish Forest Centre	Eeva-Liisa Repo, Head of Economic Development, until 31 December 2023 Timo Pisto, Head of Economic Development, from spring 2024	Anu Hilli, Forest Management Specialist
Finnish Environment Institute	Teemu Ulvi, Research Engineer	Maria Kopsakangas-Savolainen, Research Professor
Council of Oulu Region	Markus Erkkilä, Planning Director	
University of Oulu	Eva Pongrácz, Professor	Arja Rautio, Research Professor, University of the Arctic, Vice-President, Research
Youth Council	Iida Hyvärinen	
Canemure Project	Ritva Imppola, Project Manager Eeva Suonperä, Project Planner Joonas Rukajärvi, Project Planner	

## Members of the steering group

### Council of Oulu Region:

Jussi Rämets, Planning Director; Deputy Member Tuomas Kallio, from October 2020 Erika Kylmänen, Environmental Manager

### Northern Ostrobothnia ELY Centre:

Petri Keränen, Director of Business, Labour and Expertise; Timo Lehtiniemi, Deputy Member, Head of Rural and Energy Unit

Timo Mäkikyrö, Director of Transport; Deputy Member Heino Heikkinen, Head of Transport Systems Unit

### Natural Resources Institute Finland:

Virpi Alenius, Development Manager; Deputy Member Anne Tolvanen, Professor

### Oulu University of Applied Sciences Ltd:

Chairman Tuomo Pesola, Head of Education and RDI, Natural Resources; Deputy Member Ritva Imppola, Project Manager

### Educational Consortium OSAO:

Ilkka Kettunen, Study Manager; Deputy Member Jussi Kangasmaa, CEO, OAKK adult education institute

### University of Oulu:

Riitta Keiski, Dean, Professor; Deputy Member Eva Pongrácz, Professor

### Finnish Forest Centre:

Eeva-Liisa Repo, Head of Economic Development; Deputy Member Eljas Heikkinen, Forest Management Specialist

### Finnish Environment Institute:

Raimo Ihme, Key Account Manager; Deputy Member Teemu Ulvi, Research Engineer

Funder's representative: Anne-Maaria Kurvinen, Financial Specialist, ELY Centre

Secretary: Auli Suorsa, Specialist, Council of Oulu Region

The steering group may invite other experts and representatives in the field to its meetings as appropriate.

**Responsible director:** Jussi Rämets

**Project Manager:** Ritva Isomäki

Duration of the project: 1 May 2019–30 April 2020; Funding: ELY Centre, ERDF, EUR 260,192

## Low-emission transport – a propulsion-based calculation model for road transport emissions and the potential for propulsion changes

The work was carried out by Katja Kaartinen and Marko Tikkanen, Sitowise Oy. Vesa Laine and Kati Kiiskilä from Sitowise Oy also participated in the work.

The work was guided by a steering group:

Olli Kiviniemi, Council of Oulu Region

Päivi Hautaniemi, Heino Heikkinen and Soile Purola, Northern Ostrobothnia ELY Centre

Marko Mäenpää and Helena Waltari, Finnish Transport and Communications Agency

Saija Räninä, City of Oulu

## Scenario review on the sustainable utilisation of agricultural biofractions and side streams as well as the impact of measures in Northern Ostrobothnia

The work was carried out by Heikki Savikko and Joonas Hokkanen, Ramboll Finland Oy.

The work was guided by a steering group:

Tarja Bäckman, Haapavesi-Siikalatva Region Joint Municipal Authority

Ritva Imppola, Oulu University of Applied Sciences

Timo Lehtiniemi, Northern Ostrobothnia ELY Centre

## Development of energy use of peat in Northern Ostrobothnia, impact on the wood supply chain and greenhouse gas emissions

The work was carried out by Jenni Patronen and Niklas Armila, AFRY Management Consulting Oy.

The work was guided by a steering group:

Bioenergia ry (Hannu Salo, Regional Manager, MH)

Kanteleen Voima Oy (Juha Ollila, Procurement Manager)

Natural Resources Institute Finland (Taneli Kolström, Senior Adviser)

Oulun Energia Oy (Pertti Vanhala, Business Director)

Finnish Forest Centre (Eeva-Liisa Repo, Head of Economic Development)

Ministry of Economic Affairs and Employment (Petri Hirvonen, Specialist; Petteri Kuuva, Industrial Counsellor)

Jussi Rämets and Ritva Isomäki work in all of the steering groups for the detailed scenarios

# Message from young people



Climate work and sustainable development are a necessity that unites generations.

Northern Ostrobothnia has a great opportunity to invest in sustainable development as well as the diversity of our nature and its permanence.

Above all, young people are worried about how the effects of climate change will be visible in our home regions. The large size of our region must be taken into account in climate work. Its vastness is evidenced, among other things, by the survey conducted for our youth council, which charted young people's thoughts about what the dearest nature in their own municipality is. The responses described a wide range of nature from dunes to fells and wildwoods.

Young people appreciate our local nature, including its purity and safety. All young people must have the opportunity to enjoy the nature around them and to access the forest to pick lingonberries and blueberries, and thus know their roots. The built environment must also support human wellbeing and health. Nearby nature must also be preserved in urban environments.

We must invest in sustainable and easy mobility from the surrounding municipalities to the city by increasing public transport lines and promoting commuter train traffic. We must make sustainable choices easy and profitable.

We need to encourage local tourism in Northern Ostrobothnia and invest in our nature sites. Why look far for what we have near? The attractions of our region stem from our flowing waters, green forests and frozen ground.

We will encourage the production and use of environmentally friendly domestic food. Sustainable agriculture secures the self-sufficiency of future generations in our region. Self-sufficiency and security of supply must also be ensured now, while respecting the environment.

We take care of our carbon sinks with proper forest management.

Our region's climate work towards a sustainable tomorrow will be promoted while having these greetings from young people in Northern Ostrobothnia in mind.

We have a responsibility for tomorrow. Thank you!

Second meeting of the Advisory Board for Climate Action 26 January 2023, Iida Hyvärinen

[Northern Ostrobothnia Climate Roadmap 2021–2030 – Towards a carbon neutral Northern Ostrobothnia 1.0](#) (Publications of the Council of Oulu Region A:51)

[Northern Ostrobothnia Climate Roadmap \(POPilmasto\) project](#)

[Snapshot workshop 11 March 2020 recordings:](#)

Videos: Saha Prod Oy; subtitles Spoken Oy

[More detailed reports:](#)

- Low-emission transport – a propulsion-based calculation model for road transport emissions and the potential for propulsion changes (Sitowise Oy)
- Sustainable utilisation of agricultural biofractions and side streams as well as the impact of measures in Northern Ostrobothnia, a scenario review (Ramboll Finland Oy)
- Development of peat energy use in Northern Ostrobothnia, effects on the wood supply chain and greenhouse gas emissions, a report (AFRY Management Consulting Oy)

[Towards Carbon Neutral Municipalities and Regions \(Canemure\) project](#)

[Northern Ostrobothnia Transport System Plan 2040](#)

[Northern Ostrobothnia Regional Forest Programme \(AMO\) 2021–2025](#), Finnish Forest Centre

[Northern Ostrobothnia rural development strategy 2023–2027](#)

[Northern Ostrobothnia Bioeconomy Development Strategy 2015–2020](#)

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The images on the roadmap show the regional symbols of Northern Ostrobothnia: the regional flower (marsh tea) and the regional bird (Eurasian crane). In addition, the story map features the regional mammal (stoat) and the regional fish (whitefish).

# Northern Ostrobothnia Climate Roadmap 2021–2030 2.0

Towards a carbon neutral Northern Ostrobothnia

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Everything matters

